PB-215 934

REFUSE COLLECTION AND DISPOSAL, AN ANNOTATED BIBLIOGRAPHY 1958-1959. SUPPLEMENT D

Edward R. Williams, et al

Public Health Service
Cincinnati, Ohio

1967

DISTRIBUTED BY:

NTIS

National Technical Information Service
U. S. DEPARTMENT OF COMMERCE
5285 Port Royal Road, Springfield Va. 22151

PB 215 934

PUBLIC HEALTH BIBLIOGRAPHY SERIES, NO. 4 SUPPLEMENT D

REFUSE COLLECTION AND DISPOSAL

An Annotated Bibliography
1958-1959

NATIONAL TECHNICAL INFORMATION SERVICE

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service

79

Other volumes in the Public Health Bibliography Series No. 4 are listed below:

Refuse Collection and Disposal, A Bibliography, 1941-1950.
PHS Publication No. 91. 90 pp. 1951. Out of print.

Refuse Collection and Disposal, A Bibliography, 1951-1953.
PHS Publication No. 91—Supplement A. 40 pp. 1954

Refuse Collection and Disposal, An Annotated Bibliography, 1954-1955.
PHS Publication No. 91--Supplement B. 32 pp. 1956.

Refuse Collection and Disposal, An Annotated Bibliography, 1956-1957.
PHS Publication No. 91—Supplement C. 48 pp. 1958.

Refuse Collection and Disposal, An Annotated Bibliography, 1960-1961.
PHS Publication No. 91--Supplement E. 63 pp. 1963.

Refuse Collection and Disposal, An Annotated Bibliography, 1962-1963.
PHS Publication No. 91--Supplement F. 60 pp. 1966.

Public Health Bibliography Series No. 4, Supplement D

REFUSE COLLECTION AND DISPOSAL

By
Edward R. Williams
Senior Sanitary Engineer
Ralph J. Black
Senior Sanitary Engineer

Bibliography
1958-1959

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Bureau of Disease Prevention and Environmental Control
National Center for Urban and Industrial Health
Cincinnati, Ohio 45200

I

Public Health Bibliography Series No. 4
Supplement D

Public Health Service Publication No. 91
Supplement D

Reprinted - 1967

II

C O N T E N T S

By Title Numbers

	Page
Preface	IV
A. Regulations (including laws and ordinances) 1-10	1
B. Finances (including costs, fees, taxes, etc.) 11-18	2
C. Storage (including methods and equipment) 19-37	4
D. Collection and Disposal - General 38-71	7
E. Collection - Equipment 72-124	13
F. Collection - General 125-188	22
G. Disposal - General 189-216	34
H. Disposal - Composting and Reduction 217-239	40
I. Disposal - Incineration 240-276	45
J. Disposal - Open Dumps 277-284	52
K. Disposal - Salvage 285-287	54
L. Disposal - Sanitary Landfill 288-342	55
M. Litter - Collection and Disposal 343-358	66
Periodical Publications Cited	70
Other Publications Cited	71
Author Index	72

P R E F A C E

This supplement covers the period 1958-1959, and is arranged in sections which correspond to the various administrative and operational phases of the broad field of refuse collection and disposal. As in Supplements B and C, the references have been annotated for increased usability as an aid in the exchange of information in both the research and operational phases of refuse sanitation activities.

SELECTED REFERENCES IN THE FIELD OF REFUSE COLLECTION AND DISPOSAL

A. REGULATIONS (including Laws and Ordinances)

Anonymous:

1. ASTORIA'S ORDINANCE PROVIDES FOR CONTRACT: Refuse Removal Journal, 2:11:18, November 1959.

   The recently passed Astoria ordinance is given. It sets up a single contract, provides conditions hauler must meet, and contains measures to protect him.

2. CITY ORDINANCE GOVERNS REFUSE STORAGE AREA: The American City, 74:4:44, April 1959.

   The refuse storage provisions of the Pomona, California, building code are outlined.

3. COLUMBUS, O. AIMS AT GARBAGE FREE STATUS THROUGH GRINDERS: Refuse Removal Journal, 1:4:33, April 1958.

   A review of local conditions in Columbus, Ohio, leading to the passage of legislation which requires the installation of garbage disposers in al new dwellings, restaurants and eating places having kitch s.

4. DAVENPORT'S COMPREHENSIVE REFUSE COLLECTION ORDINANCE: The American City, 73:1:9, January 1958.

   The entire refuse collection ordinance for Davenport, Iowa, is given. The ordinance covers refuse storage and collection and includes fees and penalties.

5. KANSAS CITY ENACTS NEW REFUSE ORDINANCE: Refuse Removal Journal, 1:11:10, November 1958.

   The complete text of a comprehensive new ordinance on littering as adopted by Kansas City, Missouri.

6. REFUSE BOOK SHOWS GREAT RANGE OF U. S. ORDINANCES: Refuse Removal Journal, 2:7:16, July 1959.

   The refuse collection ordinances of several U. S. cities are cited. Great variance in these is noted.

7. REFUSE LAWS ARE A WEB OF CONTRADICTIONS: Refuse Removal Journal, 1:3:9, March 1958.

   A brief review of local refuse collection ordinances and regulations with examples of some of their pecularities.

A. REGULATIONS (including Laws and Ordinances) contd.

Anonymous:

8. WICHITA'S ORDINANCE: Refuse Removal Journal, 1:4:15, April 1958.

   The important sections of the refuse storage and collection ordinance adopted by the city of Wichita, Kansas, in full.

Creisler, Joe

9. NEW STATE LEGISLATION ON DEAD MARINE MAMMAL DISPOSAL: California Vector Views, 6:5:32, July 1959.

   Section 13103 was added to the Fish and Game Code, allowing expenditures, at the discretion of the Board of Supervisors, from the County Fish and Game Fine Fund to pay for disposing of carcasses of dead seals and sea lions found on ocean beach areas.

Graham, Ralph C.

10. DAVENPORT WRITES NEW REFUSE COLLECTION, DISPOSAL ORDINANCE: Refuse Removal Journal, 1:3:16, March 1958.

    Complete text of the refuse collection ordinance for Davenport, Iowa.

B. FINANCES (including Costs, Fees, Taxes, etc.)

Anonymous:

11. CHICAGO AREA DRIVERS GET WAGE INCREASE: Refuse Removal Journal, 2:11:8, November 1959.

    The proposed pay increases for Chicago refuse truck drivers and helpers are given.

12. REFUSE COSTS CUT $125,000 ANNUALLY AT OAK PARK, ILLINOIS: American Public Works Association News Letter, 26:4:15, April 1959.

    The basis of this article is an account by Frank Smiley on the way in which Oak Park devised a more economical system of refuse collection and disposal. The principal problem was recognized as the inefficiency resulting from a separate collection system. A combined system was begun; other changes and improvements made.

B. FINANCES (including Costs, Fees, Taxes, etc.) contd.

Anonymous:

13. TACOMA TO UPGRADE REFUSE COLLECTION: The American City 74:3:33, March 1959.

    An increase in Tacoma's garbage utility rate from 90 cents to $1.10 per month has made possible rejuvenation of its garbage fleet.

14. THREE ALABAMA CITIES ADOPT GARBAGE COLLECTION FEES: The American City, 74:3:40, March 1959.

    Three Alabama cities of less than 5,000 population have recently adopted garbage collection ordinances that include collection fees to cover the cost of this service. Brief details are given.

15. WHAT HAULERS PAY AT MUNICIPAL INCINERATORS: Refuse Removal Journal, 2:9:26, September 1959.

    A survey has found considerable variation in charges for private use of city facilities and many differences in administration. The charges made in forty cities are shown.

Dunlap, Roy L.

16. COMMERCIAL REFUSE RATES TO COVER COSTS: Public Management, 41:11:257, November 1959.

    An analysis of the costs of municipal refuse collection in Snyder, Texas, for commercial establishments indicated that existing rates were bringing in little more than one-half of the cost of collection. New rate structure used to rectify situation was based on 32-gallon containers or their equivalent in volume.

Keane, Mark E.

17. CUTS REFUSE COLLECTION AND DISPOSAL COSTS BY 30 PERCENT: Public Management, 41:5:114, May 1959.

    A brief report is given by village manager of Oak Park, Illinois, on the great reduction of refuse service costs there. An extensive study of the existing system was followed by reorganization. A large change instituted was that of shifting from a separate to a combined collection system.

B. FINANCES (including Costs, Fees, Taxes, etc.) contd.

Leake, W.

18. INCINERATOR COSTS AT LOUISVILLE, KY,: The American City, 74:4:157, April 1959.

    The operating cost of the Louisville incinerator is discussed and shown in tables.

C. STORAGE (including Methods and Equipment)

Anonymous:

19. CONTAINERS AT TWO BIG FIRMS: Refuse Removal Journal, 1:5:22, May 1958.

    Use of attachable refuse containers in two industrial plants at Passaic, New Jersey.

20. CONTAINERS BETTER CARO, MICHIGAN, BUSINESS CENTER: Refuse Removal Journal, 2:10:14, October 1959.

    Caro, Michigan, has recently discarded eight back-alley incinerators for container system. A great improvement in appearance, more economical operation, and removal of serious fire hazard have resulted.

21. DETROIT SHOWS WAY TO CLEAN UP AT A SAVING TO EVERYBODY: Refuse Removal Journal, 1:4:18, April 1958.

    The city of Detroit's campaign to improve refuse storage conditions. A combined approach of education and enforcement was tested in a 392 block area of the city, found effective, and then used city-wide. One of the first objectives was to end the use of the open 55-gallon oil drum as a refuse receptacle.

22. THE EVOLUTION OF A NEW REFUSE COLLECTION HELPER: Refuse Removal Journal, 2:8:10, August 1959.

    The trial and error method enabled a Long Island chemical firm to produce a useful new collection container. The container simplifies backyard collections by reducing number of trips to truck through greatly lessened weight and increased capacity.

23. GALVANIZED WARE COUNCIL BOOSTS RIGHT CONTAINERS: Refuse Removal Journal, 1:10:8, October 1958.

    How this manufacturer's trade association works with governmental officials and private contractors to promote the use of galvanized steel refuse containers with close-fitting covers.

C. STORAGE (including Methods and Equipment) contd.

Anonymous:

24. IT ALL COMES OUT IN THE WASH: Public Cleansing and Salvage, 49:584:211, April 1959.

The problem of maintaining one type of refuse container in a hygienic condition is discussed. Various methods of cleaning are reviewed; steam cleaning is considered the most efficient.

25. IT'S THE WORLD-WIDE LURE OF THE OLD GARBAGE CAN: Refuse Removal Journal, 1:4:22, April 1958.

The efforts of a London constable and magistrate to prevent drunks from attacking dust bins (trash cans).

26. KENTUCKY TOWN HAS NEW LOOK: Refuse Removal Journal, 1:4:13, April 1958.

A tour of the alleys in Hopkinsville, Kentucky, made by the Junior Chamber of Commerce, triggered a campaign to improve refuse storage. City merchants purchased 25 attachable containers which are serviced by a city packer truck.

27. NEW DEODORANT SPRAY DISINFECTS; REPELS FLIES: Refuse Removal Journal, 1:11:13, November 1958.

A new deodorant developed for the refuse industry, and first used by a private contractor in Long Island, New York, is being used to deodorize, disinfect and, in some applications, perfume garbage cans.

28. REFUSE HOPPER DESIGNED FOR DOCK-LEVEL DUMPING: Refuse Removal Journal, 1:12:14, December 1958.

A new gravity dump refuse container has been introduced to solve dock-level refuse handling problems where other attachable containers cannot be effectively used.

29. ROCKEFELLER CENTER'S REFUSE SYSTEM A MODEL: Refuse Removal Journal, 1:5:7, May 1958.

Rockefeller Center's refuse collection service has been provided by the same contractor since 1932. The contractor uses 20-yard packer trucks for rubbish collection service in the "city within a city."

244-285 O - 67 - 3

C. STORAGE (including Methods and Equipment) contd.

Anonymous:

30. SACKED--MULTI-WALL PAPER CONTAINERS FOR RUBBISH COME TO BRITAIN: Public Cleansing, 49:591:725, December 1959.

The use of multi-wall paper sacks as refuse containers in Sweden, Holland, West Germany, is described.

31. STORAGE AND DISPOSAL OF SHIP REFUSE: Public Cleansing and Salvage, 48:574:276, June 1958.

Various methods of disposing of ship refuse, both at sea and in dock areas,are discussed briefly. The regulations governing this process vary; therefore, the methods employed are quite often dissimilar.

32. THE RUBBISH GOES ROUND AND ROUND: Public Cleansing, 49:591:717, December 1959.

Salford has solved the problem of refuse collection in 15-storey flats by the installation of a turntable system. Important design and operational features described.

33. TWO FIRMS MARKET CONTAINERS: Refuse Removal Journal, 1:3:12, March 1958.

Two new detachable refuse container systems for use with packer trucks. Both feature tailgate loading.

Ramkar, D, F.

34. GOOD REFUSE CONTAINERS COME FIRST: The American City, 73:5:174, May 1958.

Control of insects and rodents through improved sanitation practices, before acute conditions arise and without the imposition of tax increases, is the cooperative goal of the Hammond, Indiana Health Department, the U. S. Public Health Service, and the Indiana State Board of Health. The first step in the program was a "Garbage Can Selling Campaign." A long-range vector control plan has also been developed.

Stirrup, F. L.

35. REFUSE - STORAGE RECEPTACLES: Public Cleansing and Salvage, 48:569:13, January 1958.

A review of the problem of satisfactory dustbin design, construction and provision is presented. A very factual article of interest to those concerned with selection and maintenance of refuse containers.

C. STORAGE (including Methods and Equipment) contd.

Vincent, Charles L.

36. CAREFUL USE OF PLASTIC LINERS ELIMINATES NEED FOR CLOTH BAGS: Modern Sanitation and Building Maintenance, 11:8:23, August 1959.

Describes the successful use of 0.0015 gauge polyethylene plastic garbage can liners without cloth bags.

Vincent, Charles L.

37. PACKAGE TRASH IN PLASTIC BAGS FOR SAFE AND SANITARY DISPOSAL: Modern Sanitation and Building Maintenance, 11:5:22, May 1959.

Discusses the use of plastic garbage can liners with cloth bags at St. Lukes Hospital, New York, New York. This method reduces the opportunity for disseminating bacteria (Staphylococcus aureus), and was found to be more economical.

D. COLLECTION AND DISPOSAL - GENERAL

Anonymous:

38. BIG DRIVE FOR MODERN SANITATION GETS RESULTS: Refuse Removal Journal, 1:5:19, May 1958.

A survey, which revealed that only 59% of the private residences were handling refuse in a sanitary manner, led to improvements in refuse storage and disposal methods in Johnson City, Tennessee.

39. CANTON RECOMMENDATIONS: Refuse Removal Journal, 2:1:21, January 1959.

The city of Canton, Ohio, recently made a study of refuse collection and disposal practices. As a part of this survey, a questionnaire was answered by officials in several other cities. The recommendations made are included in this article.

40. CANTON REFUSE STUDY MAKES MANY INTERESTING POINTS: Refuse Removal Journal, 2:5:10, May 1959.

The 1958 refuse collection and disposal system study of Canton engineers is reported. The importance of modern equipment in economy and efficiency of operation is stressed.

D. COLLECTION AND DISPOSAL - GENERAL (contd.)

Anonymous:

41. CHICAGO HAULER GIVES VIEWS ON NATIONAL GROUP: Refuse Removal Journal, 1:5:10, May 1958.

A member of the Chicago and Suburban Ash and Scavenger Association cites advantages which both contractors and manufacturers might enjoy by the formation of a national association of private refuse contractors.

42. FORMER N. Y. CHIEF FINDS PRIVATE HAULERS NEEDED: Refuse Removal Journal, 1:4:9, April 1958.

New York City's policies and accomplishments under the direction of former Commissioner of Sanitation, Andrew W. Mulrain.

43. FUTURE PUBLIC CLEANSING ARRANGEMENTS IN WANDSWORTH: Public Cleansing and Salvage, 48:576:393, August 1958.

The Wandsworth Borough Council has carried out a comprehensive survey to determine the most suitable refuse collection and disposal method for the borough. The principles decided upon to be followed, described as "hygienic and efficient," are outlined.

44. HARTFORD AN EXAMPLE OF COOPERATION: Refuse Removal Journal, 1:2:26, February 1958.

In Hartford, Connecticut, city forces collect residential refuse, and private collectors serve commercial and industrial establishments. Disposal unit costs reported as $2.41 per ton for 600-ton bin and crane incinerator and $0.35 per ton for sanitary landfill.

45. MODERN EQUIPMENT EASES HIGHWAY LITTER PROBLEM: Refuse Removal Journal, 1:10:11, October 1958.

Jackson County, Missouri, uses a "portable dump" system to solve a severe highway litter problem. The cost for removal of 5,000 truckloads of trash from one three-mile stretch of road was $30,029. A system of materials handling was selected, using two trucks and several 20 and 25 cubic yard detachable containers placed at convenient locations.

46. N. J. CONTRACTORS ASSOC. ENTERS ITS THIRD YEAR: Refuse Removal Journal, 1:4:14, April 1958.

The aims and purposes of the New Jersey State Municipal Contractors' Association with a discussion of some of the common problems of private and contract refuse collectors in other areas.

D. COLLECTION AND DISPOSAL - GENERAL (contd.)

Anonymous:

47. NEW FOODS BUILD UP REFUSE PILE: Refuse Removal Journal, 1:8:28, August 1958.

Trash production has increased from an average of 1-1/2 to 3 pounds per person per day in Philadelphia during the past ten years.

48. NEW LEASE ON LIFE FOR MOSES LAKE AS OPEN DUMPING ENDS, LANDFILL BEGINS: Refuse Removal Journal, 1:1:25, January 1958.

The refuse collection and disposal system of Moses Lake, Washington, was overhauled. A five-year contract was awarded and a city-owned, contractor-operated sanitary landfill established.

49. A NEW USE FOR NEW JERSEY RAILROADS--REFUSE HAULING: Refuse Removal Journal, 1:4:12, April 1958.

A group of 21 northern New Jersey communities are investigating a proposed plan to use railroads for long-distance hauling of refuse. Under the plan, prompted by impending legislation against open dumping, refuse would be collected by truck and taken to sidings close to the collection points in the various communities. The refuse would be shipped to southern New Jersey for disposal by sanitary landfill in areas selected by the state for reclamation.

50. PEORIA CONTRACTORS RUN A 'HEADS UP' OPERATION: Refuse Removal Journal, 1:11:24, November 1958.

Private contractor,in serving suburban area near Peoria, Illinois, provides novel features for customers. Included are packer trucks, attachable containers for commercial establishments, drive-in payment window, sales of refuse cans, and sanitary landfill disposal.

51. PEORIA'S EIGHT YEARS OF PRIVATE DISPOSAL AN EXAMPLE TO OTHERS: Refuse Removal Journal, 1:1:20, January 1958.

Peoria and Peoria Heights, Illinois, are served by one contractor. Refuse is collected once a week from 33,000 homes, and more frequently at about 300 commercial establishments. Disposal is by sanitary landfill.

D. COLLECTION AND DISPOSAL - GENERAL (contd.)

Anonymous:

52. PROGRESS IN MUNICIPAL SANITATION: Public Works Engineers' News Letter, 25:3:1, March 1958.

A digest of remarks by Richard Fenton, Operations Sanitary Engineer, New York City. Items discussed include: (a) the cleaning of streets; (b) the removal of snow and ice; (c) the collection of refuse; and (d) the disposal of refuse.

53. PUBLIC ACCEPTANCE OF DISPOSAL IS DIFFICULT: Refuse Removal Journal, 1:9:7, September 1958.

A court case brought by a Philadelphia disposal site operator against protesting neighbors who used a "human barricade" to block trucks from entering the landfill grounds.

54. PUBLIC RELATIONS ARE A VITAL CONSIDERATION: Refuse Removal Journal, 1:11:12, November 1958.

An example of complete, well-presented information from Grand Prairie, Texas, concerning the refuse collection work of the Department of Sanitation.

55. SANITARY ENGINEER'S SPEECH COVERS RANGE OF INDUSTRY: Refuse Removal Journal, 1:4:20, April 1958.

Excerpts of a speech by Stafford W. Graydon on municipal refuse collection in Atlanta, Gerogia.

56. SUPER SERVICE SELLS FOR BIGGEST MONTREAL HAULER: Refuse Removal Journal, 1:4:6, April 1958.

A brief account of the contract refuse collection service provided for Montreal, Canada, and 14 suburban communities by the largest contractor serving the area. Operations are divided into three parts: the city of Montreal, the 14 suburban communities, and industrial collection. Collection is made in Montreal for a fee of $8.00 per ton. Disposal within the city is at municipal incinerators, while landfill disposal is used for many of the outlying collection districts.

57. TENNESSEE HAULER GETS PLAUDITS OF SANITARIANS: Refuse Removal Journal, 2:6:8, June 1959.

The work of a private sanitation company in suburban Jackson, Tennessee, in controling roadside dumping of refuse is described. A great deal of credit is given C. H. Travis for organizing and conducting this outstanding vector control project.

D. COLLECTION AND DISPOSAL - General (contd.)

American Society of Civil Engineers, Sanitary Engineering Research Committee:

58. SED RESEARCH PROJECT NO. 14: A SURVEY OF THE PRESENT STATUS OF REFUSE ENGINEERING RESEARCH AND DEVELOPMENT, Proceedings of the American Society of Civil Engineers, Journal of the Sanitary Engineering Division, 84:SA1:1539, February 1958.

Present professional status of refuse collection and disposal activities in the U. S. and abroad is summarized and critically evaluated. Data concerning new developments and recommendations for improved practices are reviewed.

Bevan, R. E.

59. SMOKELESS ZONES: Public Cleansing, 49:587:452, July-August 1959.

A discussion of the effects of the British clean air policy upon refuse collection and disposal services.

Burton, Grant H.

60. RETURN TO LAREDO: Texas Health Bulletin, 11:9:12, October 1958.

A detailed review of Laredo's community sanitation project. Improved refuse sanitation together with elimination of privies and improved animal excreta disposal resulted in a 52 percent reduction in diarrheal diseases.

Davies, A. G.

61. SANITATION OPERATIONS IN FRANKFURT, GERMANY: The American City, 73:2:94, February 1958.

Officials at the International Congress on Public Cleansing, held at Frankfurt, had the opportunity to compare Frankfurt's sanitation program with that of other cities. It was found that this city of 660,000 persons compares favorably with U. S. cities of similar size in the area of collection; it is substandard in disposal operations. Reasons for this situation are discussed.

D. COLLECTION AND DISPOSAL - GENERAL (contd.)

Duncan, Alexr. H.

62. THE BASIC FACTOR -- REFUSE: Public Cleansing and Salvage, 1958 Special Supplement, page 68.

A discussion of the methods of sampling refuse, together with an explanation for the trends observed.

Jones, Bert E.

63. CENTRALIA, WASHINGTON, ADOPTS A REFUSE PROGRAM: The American City, 73:3:201, March 1958.

A new refuse collection and disposal program replaces do-it-yourself system. City ordinance provides modern collection vehicles and sanitary landfill. Service charges are given; participation is mandatory.

Liebman, Henry

64. WORLD'S GREATEST HOUSEKEEPING JOB--A $100,000,000 OPERATION: Sweep, 1:1:16, Spring 1959.

Organization, staffing, and duties of New York City's 13,400-employee Department of Sanitation are discussed by the Director of Operations.

Schwartz, A. M.

65. YOUR ACHING BACK: Sweep, 1:1:10, Spring 1959.

Dr. Schwartz, New York City's Department of Sanitation Medical Officer, gives rules for sanitation men that can help reduce the number of back injuries.

Shannon, George C.

66. COLLECTION AND DISPOSAL IN ANCHORAGE, ALASKA: Refuse Removal Journal, 2:2:10 February 1959.

The method of refuse collection which aids the city of Anchorage in maintaining a high standard of public sanitation is described. Daily commercial pick-ups and weekly residential service are described.

Taylor, E. J.

67. NOT SO DUSTY: Public Cleansing, 49:589:596, October 1959.

The problem of collecting and disposing of dust-laden air from a large refuse disposal works is reviewed. A recently designed wet collector is described by this British engineer as a possible solution to the problem.

D. COLLECTION AND DISPOSAL - GENERAL (contd.)

Waldrop, R. H.; Peel, R.; Schoof, H. F.

68. FLY MOVEMENT STUDY SHOWS BENEFITS OF CONTROL PROGRAM: Modern Sanitation and Building Maintenance, 10:9:19, September 1958.

Radioactively tagged flies were used to study the effect of improved refuse storage, collection and disposal; elimination of privies, and improved animal excreta disposal in Laredo, Texas.

Whalebone, D. P.

69. THE PUBLIC CLEANSING SERVICE OF THE BOROUGH OF DAGENHAM: Public Cleansing and Salvage, 48:571:110, March 1958.

A brief report giving data on refuse collection and disposal, street cleansing, gully emptying, cesspool emptying, kitchen-waste collection and public conveniences in the borough.

Wilson, N. G.

70. A BRITISH SURVEY OF FOREIGN REFUSE PRACTICE: Refuse Removal Journal, 2:3:15, March 1959.

Mr. Wilson reviews the overseas programs of "public cleansing" in a detailed manner. Mechanical cleansing, litter campaigns, and composition of refuse are among the aspects of refuse practice considered.

Wilson, N. G.

71. SCOTTISH AUTHORITY TELLS OF BRITISH PRACTICES: Refuse Removal Journal, 1:7:25, July 1958.

British refuse storage, collection and disposal practices, and street-cleaning practices. The compost produced by Edinburgh's 100-tons-per-week unit is marketed at a price of two pounds per ton.

E. COLLECTION - Equipment

Anonymous:

72. BRITON SURVEYS MODERN REFUSE VEHICLE DESIGN. Refuse Removal Journal, 2:7:8, July 1959.

This article, by a British writer, is a review of present trends and speculation on future possibilities in collection-truck design. Similarities in problems and thinking between Britain and this country are revealed.

244-289 O - 67 - 3

E. COLLECTION - Equipment (contd.)

Anonymous:

73. CHICAGO MANUFACTURER HAS UNUSUAL PRODUCTS: Refuse Removal Journal, 1:7:20, July 1958.

The use of a specially designed lift gate, which permits the use of closed refuse body trucks without a packer mechanism, is explained.

74. CHICAGO SANITARY DISTRICT BUYS RAILROAD CARS: Refuse Removal Journal, 2:9:14, September 1959.

The Metropolitan Sanitary District of Greater Chicago has purchased 12 new air-dump, dual drop-door dump cars. These will be put into service during the summer of 1960.

75. CITY SAVES BY USE OF LPG IN REFUSE TRUCKS: Refuse Removal Journal, 1:9:13, September 1958.

After 350,000 miles and four years of service, a refuse truck used in Hutchinson, Kansas, was found to have no trace of oil sludge in the motor. This was one of four trucks using LPG (liquid petroleum gas) fuel.

76. CONTAINER SYSTEM HELPS OAK PARK BETTER SERVICE: Refuse Removal Journal, 2:8:12, August 1959.

The city of Oak Park, Michigan, has increased refuse collection frequency and reduced cost through the use of Leach attachable containers. A large reduction in necessary man-hours has also occurred.

77. CONTRACTOR'S TRAILER IDEA WINS HIM INDUSTRIAL DISPOSAL CONTRACT: Refuse Removal Journal, 1:1:17, January 1958.

A Detroit contractor parks a trailer-mounted compactor with a 30-horsepower electric motor at a factory to provide better collection service at less cost.

78. CREATIVE THINKING HAS HELPED CHANGE INDUSTRY: Refuse Removal Journal, 1:12:10, December 1958.

Examples of Kansas City, Missouri, contractor's adaptions of detachable container equipment to serve local industry.

79. DELAWARE FIRM FEATURES SERVICE AND CLEANLINESS: Refuse Removal Journal, 2:5:12, May 1959.

The use of radio has increased speed and efficiency of a Wilmington, Delaware, refuse collection service. The best appearance in all company equipment is stressed here.

E. COLLECTION - Equipment (contd.)

Anonymous:

80. "DINOSAUR" REFUSE CONTAINERS HANDLE 40-CUBIC YARD LOADS: Public Works, 89:9:150, September 1958.

A new system of materials handling is discussed briefly. Its basic advantages are pointed out; the mechanical design described.

81. DOCK PROBLEM YIELDS TO MECHANICAL SWEEPER: Refuse Removal Journal, 2:1:8, January 1959.

A New York stevedoring firm found the job of keeping a large dock clean a needless expense and time consuming. The purchase of a street-sweeping machine solved these problems.

82. 'DUSTLESS' COLLECTION IS TREND IN MUCH OF EUROPE: Refuse Removal Journal, 1:2:21, February 1958.

The features and advantages of "dustless" refuse collection system, developed in Germany in 1895, are explained.

83. ECONOMY DUMPMASTER ON MARKET: Refuse Removal Journal, 2:1:12, January 1959.

An economy priced, recently developed, container-loading collection truck is briefly reviewed. While smaller than earlier models, it has all features of the first models.

84. GIGANTIC TASK BEGAN FOR L. A. WHEN BACKYARD INCINERATORS WERE BANNED: Refuse Removal Journal, 1:1:26, January 1958.

Los Angeles City purchases 178 trucks to initiate residential rubbish collection service at an estimated cost of 40 cents per dwelling per month. The right-hand drive trucks equipped with torque converters and compaction bodies are operated by a two-man crew.

85. IDLE EQUIPMENT TIME NEEDN'T BE WASTED TIME: Refuse Removal Journal, 2:4:12, April 1959.

The fact that heavy machinery may be idle periodically for indefinite lengths of time, due to seasonal lulls or waits between jobs, is pointed out. Suggestions for proper equipment storage are made.

86. INVENTIVENESS WINS FOR KANSAS CITY CONTRACTOR: Refuse Removal Journal, 1:11:7, November 1958.

An enterprising private contractor modifies detachable container system to serve the special needs of large industries.

E. COLLECTION - Equipment (contd.)

Anonymous:

87. KALAMAZOO HAULERS BUY NEW COMPACTORS AFTER CITY ORDINANCE BANS OPEN TRUCKS: Refuse Removal Journal, 1:1:16, January 1958.

A dozen contractors switch to compactor trucks in Kalamazoo, Michigan. Two trucks are equipped with steam cleaners to clean every garbage can at least once a month.

88. KEEP THEM CRAWLING: Public Cleansing and Salvage, 49:585:265, May 1959.

The means by which the output and performance of crawler tractors may be increased are outlined. The generalities made include: (1) planned maintenance program, (2) observance of efficient operating procedures.

89. LABOR SAVING ATTACHMENTS FOR DUMP TRUCKS: Refuse Removal Journal, 2:10:22, October 1959.

A tailgate loader and hydraulic side loader platform now being marketed are reviewed.

90. LEVITTOWN GARBAGE CANS "SMELL LIKE A LILY": The American City, 74:2:89, February 1959.

During a month-long test, homeowners in Levittown, New York, were so enthusiastic over floral-scented, sanitizing spray that the entire fleet of collection trucks will be so equipped by the spring of 1960. Estimated cost of installation of spraying equipment: $50-100 per year; yearly cost of chemicals: $1,000.

91. LOS ANGELES EXPERIMENTS WITH VACUUM-TYPE STREET CLEANING: The American City, 74:3:33, March 1959.

The Los Angeles Bureau of Maintenance of the Public Works Department is experimenting with a vacuum type street-cleaning machine. Results to date show it quite successful, and work is continuing with this unit.

92. MANUFACTURER INTRODUCES NEW COLLECTION SYSTEM: Refuse Removal Journal, 2:10:21, October 1959.

A new entry in the sanitation equipment market is discussed in terms of its advantageous features. Versatility and economy of operation are said possible with its use.

E. COLLECTION - Equipment (contd.)

Anonymous:

93. MARYLEBONE MECHANISATION: Public Cleansing, 49:589:616: October 1959.

A new street-cleansing machine recently demonstrated in St. Marylebone is described. It is said to remove every form of litter and street dust.

94. MODERN EQUIPMENT PLUS NEW PLAN LOWER COSTS: Refuse Removal Journal, 1:1:28, January 1958.

Compaction trucks, equipped with a separate engine to permit compaction of refuse while the trucks are in motion, increase efficiency. The route system of collection was abandoned and all equipment and personnel concentrated in a specified area on given days to make supervision easier.

95. NEBRASKA MAN WINS WITH SCOOTER PLAN: Refuse Removal Journal, 1:1:10, January 1958.

Motor scooters are used at Lincoln, Nebraska, for collecting refuse in residential areas of large, widely spaced homes to reduce costs.

96. NEW ENTRY IN CONTAINER FIELD CITES ADVANTAGES: Refuse Removal Journal, 1:11:16, November 1958.

A side-loading, ejection-dumping type packer, with a cable-operated packer plate, has been modified with a hydraulic loader to handle attachable containers automatically.

97. NEW LINE'S ENGINEERING DEVELOPED IN PAST YEAR: Refuse Removal Journal, 1:10:13, October 1958.

A commercial system of materials handling is reviewed. Detachable containers, in capacities to 40 cubic yards and 30,000 pound net payloads, are loaded onto the truck and unloaded automatically.

98. NEW PACKER MARKETED BY CALIFORNIA COMPANY: Refuse Removal Journal, 2:11:16, November 1959.

A new packer, which uses the principle of a hydraulic pump, has been developed. The important features of this side loader are reviewed.

E. COLLECTION - Equipment (contd.)

Anonymous:

99. NEW REFUSE BODY: FROM ECON-O-PACKER: Refuse Removal Journal, 1:9:26, September 1958.

A brief description of a new model refuse compaction body with mechanical front end loader, designed for use with detachable containers.

100. NEW TRACTORS SHOW MANY PERFORMANCE IMPROVEMENTS: Refuse Removal Journal, 2:2:20, February 1959.

Two new tractors produced by a manufacturer are described. Increased weight, horse power, and productive ability are discussed.

101. NEW YORK CITY GETS MORE REFUSE TRUCKS: BANS OPEN BURNING: The American City, 73:3:15, March 1958.

Addition of 300 new compaction trucks brings the New York City total to 1,000. New regulations prohibit burning of any kind on privately owned land within the city.

102. NOOK AND CRANNY PROBLEM: Public Cleansing and Salvage, 49:584:221, April 1959.

The fact that no machine is now available which does the street-cleaning job completely, efficiently, and economically is pointed out. The writer reports, however, upon the extent to which available power sweepers do the job.

103. PACKER PURCHASE BETTERS COAST HAULER'S POSITION: Refuse Removal Journal, 2:9:24, September 1959.

A Seattle contractor has improved his refuse hauling business, increased efficiency, and lowered costs with the acquisition of a modern, 16-yard compactor body.

104. PRIVATE FIRM LICKS COLISEUM REFUSE JOB: Refuse Removal Journal, 1:2:7, February 1958.

The New York Coliseum's specialized refuse handling needs are met through a combination of good building design and planning on the part of the private refuse contractor. Attachable containers and compactor trucks are utilized.

E. COLLECTION - Equipment (contd.)

Anonymous:

105. PRIVATE HAULER TESTS COMPANY'S NEW PRODUCT: Refuse Removal Journal, 2:9:18, September 1959.

A new 3-yard hydraulic container has been field tested for several months and is now ready for the market. Specifics of this product are discussed.

106. PRIVATE TRASH COLLECTORS MUST GET COVERED TRUCKS: The American City, 74:4:45, April 1959.

Philadelphia regulations now specify that trash and waste collectors must use permanently enclosed, steel-constructed trucks that are leakproof, spillproof, and dustproof. Approximately 90% of the private operators have complied with the regulations, which were designed to improve sanitary conditions and keep city streets cleaner.

107. REFUSE COLLECTION METHODS AND EQUIPMENT: Public Works, 89:3:92, March 1958.

Survey of 35 typical cities ranging from 51,000 to 134,000 population shows equipment use and advantages. Use of packer-type trucks ranged from 3 to 33.7 units per 100,000 population with a mean of 16.7. Vehicle cleaning practices are outlined and comments from 14 of the cities are given.

108. REFUSE TRUCK BECOMES CHIPPER TARGET: The American City, 73:9:18, September 1958.

A description of the conversion of a refuse truck into a unit to receive chips from the park department's chipper in Sacramento.

109. SCOOTER IN 'TIDY' DRIVE: Public Cleansing, 49:588:555, September 1959.

A new vehicle has been purchased by the Burnley Cleansing and Transport Department to aid in its "Keep Burnley Tidy Campaign." The important features of this scooter are described.

110. SPECIAL REFUSE CHASSIS DESIGNED BY TRUCK MAKER: Refuse Removal Journal, 2:9:16, September 1959.

A motor truck manufacturer conducted a long survey resulting in a specially designed chassis for refuse collection bodies. Design details and advantages are discussed.

E. COLLECTION - Equipment (contd.)

Anonymous:

111. STABILITY TEST: Public Cleansing and Salvage, 48:571:122, March 1958.

A test that requires the vehicle to be tilted to either side at an angle of 28 degrees from the horizontal without overturning is described. This stability test is compulsory for new public service vehicles.

112. VACUUM SWEEPER CONTRIBUTES TO AIR SAFETY IN JET AGE: Refuse Removal Journal, 2:6:24, June 1959.

An air line has a vacuum sweeper to keep its New York International Airport ramp clean of foreign material. Absolute cleanliness, necessary in jet operations to prevent ingestion damage to the engines, is thus possible.

113. VERY LARGE CONTAINERS ARE DEFINITE NEW TREND: Refuse Removal Journal, 1:8:24, August 1958.

The operation of a commercial system using containers with a capacity of up to 40 cubic yards is described.

114. WHAT'S THE BEST WAY TO RETIRE USED EQUIPMENT: Refuse Removal Journal, 2:2:12, February 1959.

Varying procedures for getting rid of aging trucks are discussed. It is stressed that conditions likewise vary in different parts of the country; therefore, several general points on the subject are made.

115. WHY NOT ELECTRICS?: Public Cleansing and Salvage, 48:577:417, September 1958.

A case is made for a return to the use of light, battery electric vehicles in public cleansing services. The reason for the gradual disappearance of this vehicle is given as the absence of suitable vehicles on the market.

Eppig, Theodore C.

116. FACTORS IN PURCHASE OF REFUSE COLLECTION UNITS: Refuse Removal Journal, 2:11:13, November 1959.

See item 117.

E. COLLECTION - Equipment (Contd.)

Eppig, Theodore C.

117. FACTORS TO CONSIDER IN PURCHASING REFUSE COLLECTION EQUIPMENT: 1959 American Public Works Association Yearbook, page 116

Eppig emphasizes the general areas of consideration which must be defined in terms of a city's own specific requirements in selecting refuse collection equipment. The factors in selection given precedence in Mr. Eppig's discussion are selection of a "chassis" and that of a truck body. Truck capacity, type of refuse material, collection method, mechanical features of trucks, appearance, versatility of equipment, and safety are also discussed as selection considerations.

Erhard, Heinrich

118. EVOLUTION OF 'DUSTLESS' COLLECTION IN GERMANY: Refuse Removal Journal, 1:8:20, August 1958.

The evolution and history of Germany's unique "dustless" system of refuse collection are covered from 1895 to the present.

Fagerlind, Carl C.

119. WE REDUCE COST AND IMPROVE REFUSE COLLECTION WITH LARGER BODIES: Public Works, 89:3:118, March 1958.

Waterloo, Iowa, converts from 9 to 16-yard refuse collection bodies. Thirteen thousand and five-hundred more people are served with no increase in crews or trucks. Economics of larger bodies cited. Sanitary landfill operation and costs data are given. Income from salvage is reported and incentive collection practice outlined.

Flint, G. H.

12-. MERITS OF RIGHT HAND DRIVE EQUIPMENT FOR REFUSE COLLECTION SERVICES: American Public Works Association News Letter, 26:6:1, June 1959

This article is a report on the Los Angeles residential combustible rubbish collection service. During the two years in which right-hand drive equipment has been operating, it has proven to pay great dividends.

244-289 O - 67 - 4

E. COLLECTION - Equipment (contd.)

Gentillon, M. B.

121. AUXILIARY POWER UNITS FOR REFUSE PACKING: The American City, 73:5:190, May 1958.

The installation of auxiliary power units for refuse packing has made Santa Monica's refuse collection system more efficient and more practical. The experimentation to solve the several problems which resulted from packing moving trucks, which had a conventional hydraulic gear pump, is described.

Lucia, Frank J.

122. ON YOUR MARK, GET SET, SNOW! Sweep, 1:3:17, Autumn 1959.

A brief account of New York City's snow-season planning and scheduling. Each year the get-ready procedure costs about $1,000,000.

Millard, R. F.

123. DUSTLESS REFUSE COLLECTION: Public Cleansing, 49:587:466, July-August 1959.

The dustless system of refuse collection as employed in Western Germany is discussed in detail. Various systems practiced in other parts of the Continent are briefly described, and the development of dustless loading in Britain is outlined.

Stenman, Alex

124. IF YOU'RE MAKING A CLEAN SWEEP: Public Cleansing and Salvage, 49:582:91, February 1959.

Mr. Stenman, city engineer of Exeter, California, discusses the various types and sizes of sweepers manufactured today. Four points to be considered in sweeper specifications are briefly outlined.

F. COLLECTION - General

Anonymous:

125. BARCELONA'S METHODS ARE MIXTURE OF OLD AND NEW: Refuse Removal Journal, 2:7:18, July 1959.

The refuse collection service of this Spanish metropolis is discussed. The interesting combination of horse-drawn vehicles and modern equipment is described.

F. COLLECTION - General (contd.)

Anonymous:

126. THE BULK CONTAINER AT THE DOCKSIDE: Public Cleansing, 49:591:726, December 1959.

A compression-type refuse collection vehicle, presently in use for bulk container clearance at Southhampton Docks, is described.

127. CITY IN L. A. COUNTY TURNS TO PRIVATE HAULING FIRM: Refuse Removal Journal, 1:3:22, March 1958.

Paramount, California, awards a 5-year contract to a private contractor for both residential and commercial collection service. Residents pay a flat fee of $1.25 per month for once-a-week combined collection. Right-hand drive packer trucks provide curb service.

128. CHICAGO'S CONTRACTORS SUPPORT CITY AIR LAW: Refuse Removal Journal, 1:2:15, February 1958.

Private scavengers support proposed ordinance that would make it illegal to handle ashes, cinders, or dust without taking precautions to minimize air pollution.

129. CONTAINER SYSTEM SOLVES DOUGLAS PLANT'S PROBLEM: Refuse Removal Journal, 1:6:26, June 1958.

Mobile attachable containers and packer trucks provide low-cost, combustible refuse removal service in aircraft factory in Santa Monica, California. Further savings were made by converting truck engine from gasoline to propane and using a 5-horsepower electric motor whenever possible in place of the power takeoff mechanism to load the truck.

130. CONTINENTAL STYLE: Public Cleansing, 49:588:541, September 1959.

The "Continental" dustless method or collection, which refers to that requiring the householder to bring his refuse container to the "kerbside," is discussed. An experiment on this method in an English town is reported.

131. CONTRACT REFUSE COLLECTION IN SEATTLE, WASHINGTON: The American City, 74:1:23, January 1959.

Seattle's private contract refuse collection system, which is the result of 20 years' experience and 20 months' preparation by the city engineering department, is described. Provisions of the contract are outlined and discussed.

F. COLLECTION - General (contd.)

Anonymous:

132. CRISIS IN THE SERVICE: Public Cleansing, 48:571:126, March 1958.

A brief discussion relating to labor shortage in the refuse collection service in Great Britain. Wages, incentive bonus system, and industrial competition for labor are discussed.

133. THE ECONOMICS OF REFUSE COLLECTION: Public Cleansing, 49:589:608, October 1959.

The economic measures which may be taken to make a system operate at optimum efficiency, as well as those to make it sound economically, are discussed.

134. HAULER SERVING UN IS ONE OF N. Y.'S LARGEST: Refuse Removal Journal, 1:6:7, June 1958.

A private contractor uses packer trucks and regularly schedules double shifts for most equipment to handle large volume of refuse produced at the United Nations headquarters ir New York.

135. THE HEALTH OF REFUSE COLLECTORS: American Public Works Association News Letter, 26:11:14, November 1959.

The results of a study to investigate the effect of work conditions upon the health of uniformed sanitation employees in New York City, as published in "The Municipal South" by Elena N. Sliepcevich, are discussed. Among the conclusions reached was the following: Arthritis and cardiovascular diseases may be classified as occupational diseases of refuse collectors.

136. HE'S NOT SO DUSTY: Public Cleansing and Salvage, 49:582:94, February 1959.

Dr. J. L. Patton, medical officer of health for Hendon, has made a report concerning refuse collectors' health. He stressed further investigation of refuse collectors' working conditions for the reduction of preventable ill health. The best protection against injuries and diseases is described; the need for instruction in the best lifting technique stressed.

F. COLLECTION - General (contd.)

Anonymous:

137. HOW BOSTON CHANGED TO PRIVATE SERVICE: Refuse Removal Journal, 2:11:8, Nobember 1959.

Boston has adopted a system of contract refuse hauling, largely due to severe snow storms which prevented adequate collection of refuse by trucks doubling as snow plows. The new system seems more satisfactory, and is more economical.

138. HOW THEY CLEANED THE BRUSSELS WORLD'S FAIR: Refuse Removal Journal, 1:10:18, October 1958.

The behind-the-scenes story of how cleaning services were planned and conducted at the 1958 Brussels Exhibition by the Department of Public Cleansing.

139. ILLINOIS VILLAGE SWITCHES TO PRIVATE CONTRACT: Refuse Removal Journal, 2:11:8, November 1959.

This brief article discusses the changeover in Niles from public refuse service to private contract operation.

140. INTERNATIONAL AIRPORT CONTRACT IS DEMANDING: Refuse Removal Journal, 1:7:7, July 1958.

Specialized 24-hour refuse collection service provided by a contractor for New York International Airport.

141. IS SANITATION WORK THE RISKIEST OF CITY JOBS? Refuse Removal Journal, 1:8:14, August 1958.

A doctoral thesis in physical education by Dr. Elena M. Sliepcevich at Springfield College, Springfield, Massachusetts, shows that New York sanitation crewmen had 69.2 disabling injuries for each million man-hours of exposure. Loggers were the only occupational group with a higher injury frequency rate.

142. LARGE CONTAINER COLLECTION COSTS: The American City, 73:11:38, November 1958.

A brief report on Winston-Salem's large-container collection system is given. This service, costing on the average $2.01 per large container per year, is in addition to regular residential and commercial garbage and refuse collection.

F. COLLECTION - General (contd.)

Anonymous:

143. LOS ANGELES RESIDENTS WANT COMBINED SERVICE: Refuse Removal Journal, 2:10:8, October 1959.

Residents in Los Angeles recently gave Mayor Paulson their views on a question concerning refuse. A strong preference (9:1) for collection of combustible and noncombustible refuse without prior separation was shown.

144. A MODEL TRANSFER STATION: Public Cleansing and Salvage, 48:579:502, November 1958.

The design and operation of the Borough of Wanstead and Woodford transfer station are reviewed.

145. PRIVATE COLLECTORS WIN A VOTE OF CONFIDENCE: Refuse Removal Journal, 2:5:6, May 1959.

A one-year trial of private service has demonstrated the efficiency and economy of local contractors in southern California. This service is being continued in the unincorporated areas of the Los Angeles basin.

146. PRIVATE HAULERS ARE THE DIFFERENCE TO NEW YORK: Refuse Removal Journal, 2:6:6, June 1959.

The largest municipal sanitation service in the U. S. and one of the most carefully organized and administered - that of New York City - is described. The importance of the private refuse contractor in the system is stressed.

147. PRIVATE HAULERS HOLD STRONG OREGON POSITION: Refuse Removal Journal, 2:8:8, August 1959.

Refuse collection systems of several Oregon cities are discussed. Most cities contract out collections to private interests; some give exclusive franchises, and others have multiple licenses for refuse work.

148. PROGRESSIVE IDEAS HELP N. J. PRIVATE CONTRACTOR: Refuse Removal Journal, 1:3:7, March 1958.

Private contractor uses compactor trucks and large detachable containers to provide modern service to the city of Passaic, New Jersey, the two nearby boroughs of Totowa and North Hailden, and the town of Cedar Grove.

F. COLLECTION - General (contd.)

Anonymous:

149. REFUSE COLLECTION BY CONTRACT: The American City, 73:7:96, July 1958.

The contract refuse collection system, in operation for several years now in Peoria, Illinois, is discussed. This system is seen as a sound one, without a major investment.

150. REFUSE COLLECTION IN U.S.A. BY PACKER-TYPE VEHICLES: Public Cleansing and Salvage, 48:574:302, June 1958.

This article summarizes data taken from a questionnaire sent to many U. S. cities with a population of about 100,000. The data relate to the economics and practices utilized.

151. REPORT FROM MOSCOW: Public Cleansing and Salvage, 49:585:260, May 1959.

Moscow's system of refuse collection and street cleansing is described. Snow removal is included as a necessary service in Moscow between November and April.

152. REPORTER FINDS REFUSE COLLECTION A TOUGH JOB: Refuse Removal Journal, 1:5:12, May 1958.

A Cleveland reporter learns that refuse collection is a hard and hazardous job when he tries to work on a regular collection crew.

153. RHODE ISLAND FIRM TAKES ON WARWICK COLLECTION: Refuse Removal Journal, 2:9:12, September 1959.

The city of Warwick, Rhode Island, is now served by a commercial contractor,after having had municipal service since 1931. This change is detailed.

154. ROCHESTER FIRM NIXED PROFESSIONS FOR REFUSE: Refuse Removal Journal, 2:6:22, June 1959.

The interesting story of the development of a disposal company in Rochester is given.

155. SEATTLE DISPOSAL COMPANY RUNS ALERT OPERATION: Refuse Removal Journal, 2:1:6, January 1959.

A single contractor serves Seattle and surrounding area in refuse collection. An excellent record of economy and service has been maintained. The factors contributing to this excellent record are presented.

F. COLLECTION - General (contd.)

Anonymous:

156. SINGLE HAULER PLEASES BATTLE CREEK CUSTOMERS: Refuse Removal Journal, 2:5:24, May 1959.

The reasons for the satisfaction of Battle Creek citizens with its refuse service are outlined. Two stops per week for residential areas and six per week for commercial and industrial customers are important factors.

157. SIT UP AND TAKE NOTICE: Public Cleansing and Salvage, 49:582:81, February 1959.

The efficient refuse collection system of two Caithness County towns is briefly described. A thrice-weekly collection is provided by a six-man staff, an 18-cubic yard dual-tip vehicle,and a small truck.

158. SOME REFUSE COLLECTION EFFICIENCY NOTES: The American City, 73:2:17, February 1958.

Graydon, a sanitary engineer in Atlanta, outlines the conditions of employment at which conscientious refuse collection crews will work best, and the performance rates which will result.

159. STRONG TREND TO PRIVATE SERVICE CONTINUES GAINS: Refuse Removal Journal, 2:9:10, September 1959.

A survey by Information Consultants, a Chicago research organization, indicated that more and more cities are choosing private refuse collection services over those operated by municipalities. This resulted, according to the article, from a greater economy and efficiency. Specific exemplary cities are cited, with details given.

160. TEN BROTHERS ACTIVE IN NEW YORK HAULING FIRM: Refuse Removal Journal, 2:5:17, May 1959.

The interesting development of a family refuse collection business is traced. Begun in 1900 with a horse and cart, the business, now run by the ten sons, is a large and modern operation.

161. TWO CHICAGO SUBURBS AWARD PRIVATE CONTRACTS: Refuse Removal Journal, 1:10:7, October 1958.

Cicero and Palatine, Illinois, award contracts for refuse collection and disposal. Both suburbs switched from municipal collection service.

F. Collection - General (contd.)

Anonymous:

162. WE NEVER REFUSE REFUSE' IS CHICAGO MAN'S SLOGAN: Refuse Removal Journal, 1:6:24, June 1958.

A father and son firm uses a fleet of seven packers for refuse collection service in Chicago and its suburbs.

American Public Works Association, Committee on Refuse Collection:

163. Refuse Collection Practice, Second Edition. American Public Works Association Research Foundation Project Number 101. Chicago: Public Administration Service, 1958. 562 pp.

This comprehensive text of American refuse collection practices, first published in 1941, has been revised by a committee of experts from the association. It contains sixteen chapters with detailed discussions on "The Refuse Collection Problem; Refuse Material; Preparation of Refuse for Collection; Factors Affecting Refuse Collection Cost; Refuse Collection Methods; Refuse Collection Equipment; Planning Refuse Collection Systems; Supplemental Transportation of Refuse; Special Refuse Collection Problems; Municipal, Contract or Private Collection of Refuse; Financing Refuse Collection Operation; Organization; Personnel; Equipment Management; Reporting, Cost Accounting and Budgeting; and Public Relations." It also contains these useful appendices: Provisions of Typical Refuse Collection Ordinances, Refuse Collection Practice in 89 Cities, Refuse Collection Cost Data 1955, Analysis and Planning of Refuse Collection Systems and a Selected Bibliography.

American Public Works Association, Street Sanitation Committee:

164. STREET CLEANING PRACTICE, Project Number 105 of the Research Foundation, A.P.W.A. Chicago: Public Administration Service, Second Edition. 1959. 424 pp.

This revision of a basic reference in the field was based on data gathered from 266 cities in the United States. Topics include: street cleaning, the control and removal of snow and ice, litter control, and provisions of typical street sanitation ordinances. A review of European street-cleaning practices and a selected bibliography are included.

244-289 O - 67 - 5

F. COLLECTION - General (contd.)

Andersen, D. A.

165. CONTRACT METHOD OF REFUSE COLLECTION: 1958 Public Works Engineers' Yearbook, page 113.

The basic provisions and the method of payment of Seattle's contract are thoroughly discussed by Mr. Anderson. The advantages and disadvantages of the contract collection are also described.

166. SINGLE CONTRACTOR SERVES ALL SEATTLE: Refuse Removal Journal, 1:11:8, November 1958.

See item No. 165.

Blatt, Donald H.

167. TOWN CONTRACTS FOR REFUSE COLLECTION SERVICE: Public Management, 40:3:64, March 1958.

West Hartford, Connecticut, has contracted for all refuse collection with the use of collection trucks owned by the town government.

Bloodgood, Don E.

168. THE COMPOSITION OF REFUSE: 1959 American Public Works Association Yearbook, page 100.

The author points out that there has been refuse on the face of the earth as long as life has existed. Professor Bloodgood then gives a detailed analysis of the changes in refuse composition over the years, the method and accuracy of statistical sampling of refuse, and of various studies made on refuse and conclusions reached thereby. Several tables, concerned with the composition and density of refuse, are given.

Brown, C. N.

169. REFUSE TRUCKS USE LPG, CUT OPERATING COSTS: The American City, 73:8:36, August 1958.

The use of LPG (liquid petroleum gas, propane) has been an important factor in simplifying the refuse collection of Hutchinson, Kansas. In addition, operating costs have been cut through the use of this fuel.

F. COLLECTION - General (cont'd.)

Carreau, Joseph W.

170. REFUSE COLLECTION IN NEW BEDFORD: Public Works, 89:3:169, March 1958.

A review of collection practices, equipment, and schedules used in New Bedford, Massachusetts.

Cook, H.

171. RELAY PROS AND CONS: Public Cleansing and Salvage, 49:581:33, January 1959.

This article is a condensation of Mr. Cook's paper based on Rochdale's experiences and views on the subject of relay system. The basic procedure followed there is outlined; inconclusive results, however, are reached as to the advantages of this system. The author does point out that, regardless of the refuse system adopted, flexibility to meet frequently changing conditions is an imperative requirement.

Creswell, M. C.

172. REORGANIZING REFUSE COLLECTION: Public Works, 90:9:108, September 1959.

Handling of refuse as a separate division of the public works department in Port Arthur, Texas, was found to be unsatisfactory A revised system, including efficient collection routes, use of large-capacity equipment, a personnel evaluation and revised maintenance procedure, is resulting in more satisfactory and economical service.

Davies, A. G.

173. DUST BENEATH THESE CHARIOT WHEELS: Public Cleansing and Salvage, 49:583:156, March 1959.

The problem of vehicle parking decreasing the efficiency of refuse collection services and street cleaning is reviewed. Several American solutions, such as parking laws and night sweeping, are presented.

Dowling, John C.

174. TOWN OF OYSTER BAY ADOPTS MUNICIPAL REFUSE COLLECTION: The American City, 73:11:106, November 1958.

The town of Oyster Bay on Long Island has grown from 80,000 in 1959 to 270,000 in 1958. Due to accompanying problems, a municipally operated system of refuse collection was inaugurated. Details of this highly successful system are given.

F. COLLECTION - General (contd.)

Gentile, S. G.; and Dempster, Andrew

175. BETTER REFUSE COLLECTION SERVICE - A CLEANER CITY AT LESS COST: Public Works Engineers' News Letter, 25:4:10, April 1958.

The papers presented by Dempster and Gentile outline refuse collection methods. This modernized program has been in operation for 15 years, bringing about greater efficiency and economy in Detroit, Michigan.

Gross, William J.

176. TOLEDO CHIEF DISCUSSES STREET CLEANING PROBLEMS: Refuse Removal Journal, 1:8:26, August 1958.

Street-cleaning and snow-removal practices of Toledo, Ohio.

Johnson, Theodore F.

177. CONTRACTOR REFUSE COLLECTION: The American City, 74:6:104, June 1959.

The city of Rockford has turned the entire system of garbage and refuse collection over to a private hauler. Result: greater economy for the city, better service for the residents.

Kennedy, Everett R.

178. WEST HARTFORD, CONNECTICUT, MODERNIZES REFUSE SERVICE: The American City, 73:9:190, September 1958.

West Hartford has made two important steps toward providing the best in refuse collection and disposal services for its citizens: The first, putting collection activities under direct city control; the second, constructing a 350-ton incinerator. Further explanation of the modernization is given.

Marsh, John

179. PERSONNEL: Public Cleansing, 49:587:520, July-August 1959.

A discussion of psychological working conditions and their effect on creating a favorable work environment.

F. COLLECTION - General (contd.)

Neilson, Robert W.

180. LAYOUT AND SCHEDULING OF REFUSE COLLECTION ROUTES: 1958 Public Works Engineers' Yearbook, page 118.

The responsibilities of the Sanitation Division of the Winston-Salem Public Works Department in the collection and disposal of refuse are reviewed. A recent survey of the collection system resulted in a new layout and schedule of collection routes, which is also described. Several tables relate further information on this service.

181. CITY REVISES ROUTES FOR GREATER EFFICIENCY: Refuse Removal Journal, 1:12:12, December 1958.

See item No. 180.

Noe, Theodore, H.

182. REVISED SCHEDULE STREAMLINES GARBAGE COLLECTION: Public Works, 90:1:100, January 1959.

The streamlined garbage collection system of the city of Winston-Salem is discussed. One important feature of the new system is a rotating, three-week collection schedule. The system is expected to provide a more equitable collection schedule, more efficient service, and an annual saving of at least $50,000.

Peacock, C.

183. "PUBLIC CLEANSING" IS EVERYBODY'S BUSINESS: Public Cleansing, and Salvage, 48:573:211, May 1958.

This paper, prepared by the cleansing superintendent in the County Borough of South Shields, was presented at the 1958 Spring Meeting of the Institute of Public Cleansing. The writer's purpose is to convince the reader of the necessity of local government members to make their work known to the general public.

Robertson, G. B.

184. EQUALIZATION OF COLLECTION ROUTES: 1959 American Public Works Association Yearbook, page 121.

At the time of publication of this article, Albuquerque was in the process of equalizing its refuse collection routes. Inefficiency had been noted, a survey conducted to determine the needs, and proposed solutions put into effect. In addition to re-routing collection, improved equipment was investigated and purchased, and manpower was better utilized.

F. COLLECTION - General (contd.)

Schwartz, A. M.

185. CARE AND PREVENTION OF OCCUPATIONAL BACK-ACHE: Refuse Removal Journal, 2:6:16, June 1959.

One of the commonest causes of disability in sanitation crewmen, backache, is discussed by the medical officer of the New York City Sanitation Department. The causes, symptoms, types, treatment, and prevention of this prevalent ailment are described.

Seeger, Deane

186. CULVER CITY TAKES OVER: The American City, 74:8:94, August 1959.

Culver City, California, recently abandoned a 30-year-old program of private refuse collection for a municipally operated system. The details of this changeover and success of early operation of the new system are discussed.

Shults, F.

187. ANALYSIS OF RELAY REFUSE COLLECTION: Public Cleansing and Salvage, 48:579:522, November 1958.

The author reviews the relay refuse collection system, showing both the advantages and disadvantages of same through several tables. The experiences of Southend-on-Sea during its changeover to this system are discussed.

Urquhart, Raymond M.

188. RESIDENTIAL COMMUNITY GETS SPECIAL REFUSE COLLECTION SERVICES: Public Works, 90:3:108, March 1959.

Frequent, regular collections, plus removal of garden debris and bulky items, meet demands of an elite suburb.

G. DISPOSAL - General

Anonymous:

189. BERMUDA HAS IT EASY ON DISPOSAL PROBLEMS - NONE!: Refuse Removal Journal, 2:8:15, August 1959.

A 35-acre area, Pembroke Marsh, provides Bermuda an almost inexhaustible site for refuse disposal. Details of the fine sanitation situation there are given.

G. DISPOSAL - General (contd.)

Anonymous:

190. CITIES REPORT ON "DEMOLITION" REFUSE PROBLEM: Public Works Engineers News Letter, 25:11:1, November 1958.

A report on data submitted by Public Works officials from 64 cities is given in this article concerning the refuse disposal problem now faced by most large cities. Alternative solutions to this problem are presented.

191. CITY ENGINEERS DISCUSS THE DISPOSAL OF TOWN'S WASTES: Public Cleansing and Salvage, 48:575:324, July 1958.

Four papers presented at a meeting of the Institution of Civil Engineers, London, are reviewed briefly. Sludge disposal, refuse disposal, manurial values, refuse tipping, and underground water pollution are covered.

192. THE CONTROL OF INSECTS: Public Cleansing and Salvage, 48:578:456, October 1958.

The comments of Mr. G. C. La Breque, entomologist in the U. S. Department of Agriculture, are critically reviewed. It is pointed out that the suggested remedies to the past nuisance problem on disposal sites are not necessarily applicable in England. The British control of flies, the only pest experienced there, is discussed briefly.

193. COUNTY DEVELOPS COMPREHENSIVE REFUSE DISPOSAL PLAN: Public Works, 89:11:90, November 1958.

Faced with a four-fold population increase, Contra Costa County, California, used topography as an index to plan for refuse disposal sites

194. 'DEMOLITION REFUSE' HAS PROBLEM PROPORTIONS: Refuse Removal Journal, 2:2:7, February 1959.

The problem of disposal of demolition timber and debris, which is assuming large dimensions with the increasing number of large-scale demolition programs in this country, is discussed. Possible solutions are described.

195. HOT GARBAGE MAY PLAGUE SANMAN OF THE FUTURE: Sweep, 1:4:6, Winter 1959.

The problem of disposing of radioactive wastes is presented. Present practices of disposal by storing and by dumping are outlined. Future measures which may become necessary are mentioned.

G. DISPOSAL - General (contd.)

Anonymous:

196. HOW CAN WE DISPOSE OF RADIOACTIVE WASTES: Refuse Removal Journal, 2:1:11, January 1959.

The dangers of radioactive wastes and the world-wide nature of this problem are discussed by the British author.

197. HOW TOKYO TACKLES A MAN-SIZED JOB: Public Cleansing, 49:591:736, December 1959.

The cleansing work managed by the Public Cleansing Bureau in the Tokyo area is discussed. Descriptions of the refuse collection, disposal, and street-cleansing methods are included.

198. MALAYAN SANITATION PROBLEMS: Public Cleansing, 49:591:705, December 1959.

Malayan rural area refuse collection and disposal are briefly outlined. The factors which determine the efficiency include the availability of funds, the degree of control over labor, and other local circumstances.

199. MARINE FIRM TACKLES TOUGHEST DISPOSAL JOBS: Refuse Removal Journal, 1:12:7, December 1958.

Waste wood and other bulky combustible materials are burned on 200-foot, all-steel barges covered with 18 inches of sand. Barges are anchored off the entrance to New York Harbor and set on fire when there is a steady west wind.

200. NOW COMES THE HOME TIN PRESS: Public Cleansing, 49:589:623, October 1959.

As an alternative version of one type of garbage grinder, an English manufacturer is offering a tin press with an additional fitment. This device is offered as a practical means of eliminating the bulk problem in relation to tins.

201. PRIDE OF PLACE GOES TO GLASGOW: Public Cleansing and Salvage, 49:581:12, January 1959.

The largest single refuse disposal unit in Great Britain, at Polmadie, Glasgow, is described. Similar in some respects to others built recently, the works have special design features of interest. These unique details are reviewed.

G. DISPOSAL - General (Contd.)

Anonymous:

202. RAILROAD, REFUSE HAULER COOPERATE ON DISPOSAL: Refuse Removal Journal, 2:5:8, May 1959.

A unique arrangement has been made in Chicago between a disposal company and a railroad. The result: a modern and efficient means of refuse disposal for the suburban areas, a better method and permanent location for garbage disposal for the refuse collecting company, and steam available as a by-product for use by the railroad. Details of the operation given.

203. REFUSE DISPOSAL AT SEA AND IN PORTS: Refuse Removal Journal, 1:7:19, July 1958.

Garbage grinders, incinerators, and refuse chutes are examples of refuse handling at the docks in some ports.

204. TOWN OF HEMPSTEAD RUNS A MODEL DISPOSAL PLANT: Refuse Removal Journal, 2:2:14, February 1959.

The efficient operation of Hempstead's disposal plant is described. An interesting feature is the external "office building" appearance of the incineration plant. Also noted is the use of bay salt water rather than town water in the operation.

205. A WORKABLE SOLUTION TO REFUSE DISPOSAL: The American City, 74:8:32, August 1959.

Recommendations of the Refuse Disposal Study Committee, sponsored by the University of Pittsburgh, Institute of Local Government, which suggest a solution to the refuse disposal problem. Based on the local point of view, the suggestions are applicable for other urban county areas.

Bowerman, R. F.

206. ECONOMIC ASPECTS OF ENGINEERING CONTROL (3) -- LAND DISPOSAL AND INCINERATION: Proceedings -- National Conference on Air Pollution, November 1958. Public Health Service Publication No. 654, pp. 322-326.

Discusses the advantages and disadvantages of sanitary landfills and incinerators for refuse disposal. Operational costs of $1 per ton for sanitary landfills, while the best operated incinerators are run in the range of $3½ to $4½ per ton. Initial costs are given as $1 million for 1,000-tons-per-day capacity for sanitary landfills and $4 to $5 million for 1,000-tons-per-day capacity for incinerators. Also suggested the economy of transfer operations, reporting that with large trailers the break-even haul distance is about 50 - 55 miles (one-way).

G. DISPOSAL - General (Contd.)

Chambers, Leslie A.

207. WHERE DOES AIR POLLUTION COME FROM?: Proceedings--National Conference on Air Pollution, November 1958. Public Health Service Publication No. 654, pp. 34-38.

Combustion of refuse is reported to produce the following: (a) 2-8 pounds of SO_2 per ton of burned material; (b) about 4 pounds of oxides of nitrogen, estimated as NO_2, per ton of mixed refuse; (c) 25 pounds of dusts, smoke, condensed fumes, etc., per ton burned; and (d) aldehydes, estimated as formaldehyde, - small quantities from incinerators of improper design.

Cowan, John H.

208. REFUSE DISPOSAL AT 5s 1d A TON: Public Cleansing and Salvage, 48:572:157, April 1958.

The problem faced by Newcastle officials with the diminishing of tipping sites for refuse within the city boundaries is described. The means of disposal decided upon to relieve this situation was the transportation of bulk in large-capacity, disel-engined road vehicles to sites outside the city. The reasons for this decision and the method involved in putting this plan into effect are outlined.

Creisler, Joe

209. THE DISPOSAL OF DEAD MARINE ANIMALS: California Vector Views, 5:10:65, October 1958.

The Del Norte County methods of dead marine-animal disposal are discussed briefly in the article. The county health department, which is responsible for this, disposes of carcasses by dynamiting where possible or by covering them with hot lime or chloride of lime where dynamiting would be hazardous. Dynamiting the carcasses has been found to be the quickest and most sanitary method.

Davies, A. G.

210. CLEANEST TOWN ON THE EAST COAST: Public Cleansing, 49:591:706, December 1959.

The resort town of Clacton, UDC, is said to be the "cleanest town on the east coast." The litter clearing, refuse collection, and refuse disposal systems there, which give this town such a well-cared-for appearance, are described.

G. DISPOSAL - General (Contd.)

Eliassen, Rolf

211. DOMESTIC AND MUNICIPAL SOURCES OF AIR POLLUTION: Proceedings --National Conference on Air Pollution, November 1958. Public Health Service Publication No. 654, pp. 132-138.

The pounds of contaminants discharged daily from domestic sources in a metropolitan area of 100,000 persons are given for backyard burning, household incinerators, apartment incinerators, burning dumps, incinerators, and sanitary landfills.

Hurst, Valerie; Grossman, Moses; Ingram, Fred R.; Lowe, Nan E.

212. HOSPITAL LAUNDRY AND REFUSE CHUTES AS SOURCE OF STAPHYLOCOCCIC CROSS-INFECTION: Journal of the American Medical Association, 167:10:1223, July 5, 1958.

The part played by modern hospital chutes for the disposal of soiled laundry and of wastes in the dissemination of air-borne bacteria was investigated. On the basis of study findings, these chutes present an undeniable hazard that demands correction. Recommendations concerning hospital chute design and practices are given.

Kenny, A. W.

213. THE DISPOSAL OF RADIOACTIVE SOLID WASTES: Public Cleansing, 49:587:425, July-August 1959.

A non-technical explanation of the characteristics of radioactive materials, what radioactive wastes arise, which may be disposed of by conventional methods, and what can be done with those for which conventional methods are unsuitable.

Michaels, Abraham

214. MANAGEMENT OF REFUSE DISPOSAL FACILITIES: 1959 American Public Works Association Yearbook, page 134.

The several current methods of refuse disposal in this country are seen by Mr. Michaels as production methods in reverse. He therefore considers the subject of sound refuse disposal management in terms of the following factors: the goal, the individual employee, the organizational form, personnel policies and employee relationships, facility design, operation and maintenance, accounting fiscal policy, planning and research, and public relations.

G. DISPOSAL - General (Contd.)

Ross, William E.

215. CENTRAL GARBAGE GRINDING PLANT AT RICHMOND, IND.: Refuse Removal Journal, 1:5:18, May 1958.

Ground garbage, after having grit removed, is pumped directly into sewage treatment plant digestors with sewage sludge to get maximum gas production. The value of the gas is high enough so that the cost of garbage disposal equipment will be paid for in five years.

Storm, Murray

216. ORANGE COUNTY'S REFUSE DISPOSAL PROGRAM: California Vector Views, 5:8:51, August 1958.

The development of Orange County's refuse disposal service by the Office of the County Surveyor and Road Commissioner is given in detail. The disposal division now operates eight sanitary landfills at a cost of $0.20 per month to the average homeowner.

H. DISPOSAL - Composting and Refuction

Anonymous:

217. COMPOST PLANT FOR BANGKOK: Refuse Removal Journal, 1:4:21, April 1958.

The city of Bangkok, Thailand, has ordered construction of a compost plant after pilot studies by the Thailand Department of Agriculture. The plant is scheduled to produce 90,000 tons of compost per year, which it is estimated will increase the rice yield by as much as 25 percent.

218. COMPOST PLANT TO REPLACE DUMPS IN BANGKOK: The American City, 73:4:29, April 1958.

Reportedly the world's largest mechanized refuse composting plant is now being constructed in Bangkok, Thailand. The three-stage process is discussed briefly.

219. COMPOSTING FIZZLE: Engineering News Record, 160:3:33, January 16, 1958.

After one year's operation, an aerobic composting plant at McKeesport, Pennsylvania, closed because of financial difficulties. Marketing difficulties of the end product and competitive pressures from industry were blamed by company officials. No adverse publicity occurred during period of operation. City is now using sanitary landfill.

H. DISPOSAL - Composting and Reduction (Contd.)

220. THE FARMER MUST KNOW ALL THE FACTS: Public Cleansing and Salvage, 49:584:213, April 1959.

The necessity to convince the agriculturalist of the merits of compost material is stressed. In general, the farmer is interested in the chemical composition and stability of the product, and the expected cost of the product.

221. MANY BENEFITS CLAIMED FOR GRINDING MACHINE: Refuse Removal Journal, 1:4:8, April 1958.

The benefits of wet grinding of refuse are discussed briefly. Large items are removed by hand, while smaller debris is automatically taken out by a "junker" before the refuse is ground. The product is reported to be odorless and unattractive to flies. The company states that a long period of testing has shown the product to be extremely valuable as an organic fertilizer.

222. MICHIGAN CITY COMPOSTS ITS REFUSE SUCCESSFULLY: Refuse Removal Journal, 1:9:14, September 1958.

A composting plant has been operating successfully in Williamston, Michigan, for over three years. Undigested sewage solids, garbage, and other organic wastes are mixed, inoculated with aerobic bacteria culture, and ground through a hammer mill. Small ferrous particles are removed with a magnetic pulley. Some other materials are removed by hand. Composting is accomplished in enclosed steel bins, each holding five tons and stacked four high. Forced air is piped into the bins and through the material. A 21-day detention time is used. The net cost of completed compost is $7 per ton.

223. NEW DISPOSAL METHOD CLAIMS BIG ADVANTAGES: Refuse Removal Journal, 1:3:10, March 1958.

A commercial garbage and refuse conversion system is described. The steps include 1) picking tables, where large or salvageable items are removed by hand, 2) primary magnetic separation of cans and ferrous objects, 3) primary grinding to reduce particle size to less than 4 inches, 4) secondary magnetic separation, 5) secondary grinding to reduce particle size to less than 3/4 inch, (sewage "waste" and a dispersion of carbon black are also introduced), 6) digestion proceeds as the refuse passes through a series of ten specially designed bins, and 7) final screening, yielding the end product. The value of carbon black lies in its high absorption and retention of the heat of the sun.

H. DISPOSAL - Composting and Reduction (Contd.)

Anonymous:

224. PROGRESS IN ISRAEL: Public Cleansing and Salvage, 49:586:333, June 1959.

Garbage composting has become a profitable undertaking in Israel, as shown by the interest of private investors in this business. The general factors - both productional and economical - are reviewed.

225. TACOMA DISCONTINUES COMPOSTING OPERATIONS: The American City, 73:7:35, July 1958.

This brief article explains the discontinuance of refuse composting in Tacoma, Washington. The method of composting which had been used is also outlined.

226. THE TIME TO COMPOST: Public Cleansing, 49:588:557, September 1959.

This report covers those aspects of municipal composting which local authorities should be informed of before beginning such a program.

227. WARNING ISSUED BY COMPOST SUPPORTER: Refuse Removal Journal, 1:2:10, February 1958.

The prediction of Mr. N. G. Wilson of Edinburgh, Scotland, that the very future of our civilization may depend on the adoption of sound composting systems is discussed in reference to the ten million tons of organic wastes produced per year in U. S. cities.

228. YOUR COMPOST MACHINES ARE WONDERFUL: Public Cleansing, 49:588:547, September 1959.

An amusing, fictional report by a "spaceman" on his observation in an English city. Of particular interest are his keen observations of wastes disposal.

American Society of Civil Engineers, Sanitary Engineering Research Committee:

229. SED RESEARCH PROJECT NO. 16: REFUSE COMPOSTING EXPERIENCE IN THE NETHERLANDS, Proceedings of the American Society of Civil Engineers, Journal of the Sanitary Engineering Division, 84:SA2:1610, April 1958.

This report reviews the results of work of the Netherlands in refuse composting. The conclusions reached are: (1) "The Netherlands compost operations have resulted in a realistic method for collection and processing municipal refuse for agricultural purposes; (2) The development of a practical system for materials handling, processing, packaging and distribution represents an outstanding achievement in solid wastes engineering."

Bridger, Roy

230. AN M.P. TAKES UP THE CUDGELS: Public Cleansing and Salvage, 49:581:26, January 1959.

A defense for the composting case is strongly made. In opposition to recent comment against this method, in terms of "health," the author describes demonstrated indices of composting merits.

231. TOWARDS A NATIONAL COMPOST SERVICE: Public Cleansing and Salvage, 48:571:134, March 1958.

The economic difficulties and uncertainties affecting municipal composting in England are reviewed. Government support, corresponding with a national program, is urged by the author.

Gordon, C. A.

232. MUNICIPAL COMPOSTING IN THE UNITED KINGDOM: Proceedings of the American Society of Civil Engineers, Journal of the Sanitary Engineering Division, 84:SA6:1852, November 1958.

Composting of refuse and sewage sludge is receiving attention as a feasible method of waste disposal. Two municipal composting plants operating in the United Kingdom are described in detail. The general trend in refuse disposal is outlined, and other composting plants making a contribution towards the development of composting are mentioned.

Gothard, S. A.

233. MECHANISED MUNICIPAL COMPOSTING: Public Cleansing, 49:587:503, July-August 1959.

The basic principles and requirements for composting are discussed briefly, followed by their application in the Jersey plant.

Martin-Leake, H.

234. DESTRUCTION INSTEAD OF CONSERVATION: Public Cleansing, 49:588:551, September 1959.

A revision of present "wastes destruction" programs in England is urged. A realistic, economically sound approach favoring organic compost formation is stressed.

Nesbitt, John B.

235. COMPOSTING MUNICIPAL REFUSE: Public Cleansing and Salvage, 49:585:251, May 1959.

The author, assistant professor of civil engineering at Pennsylvania State University, made an investigation into composting municipal refuse. His conclusions are presented in detailed form.

Scovel, Ralph E.

236. THE DANO METHOD OF REFUSE DISPOSAL: California Vector Views, 5:2:5, February 1958.

The Dano method, as adopted in America from that of Denmark, to alleviate disposal problems in congested populated areas is detailed. The description of this composting process is accompanied by photographs and an illustrative drawing.

Steffles, Milton J.

237. COMPOST OVER THE COUNTER: Public Cleansing and Salvage, 49:582:86, February 1959.

The garbage composting plant at Williamston, Michigan, is described by Mayer Steffles as a highly successful one. It is called a "pilot plant," since it is said to be the first of its kind where undigested sewage solids are mixed with organic wastes for compost production.

Stirrup, F. L.

238. PRODUCTION OF BRIQUETTED FUEL AND OF FERTILIZERS FROM REFUSE: Public Cleansing and Salvage, 49:585:275, May 1959.

A comprehensive report on an experimental compost production plant is given. The purpose of Mr. Stirrup's examination was to study the relationship of disposal to needs of the community in different areas.

H. DISPOSAL - Composting and Reduction (Contd.)

Wilson, N. G.

239. SOME VIEWS OF BRITON ON SANITATION IN THE U. S.: Refuse Removal Journal, 2:11:22, November 1959.

Wilson, engineer and manager of the lighting and cleansing department in Edinburgh, Scotland, discusses incineration in the United States and composting in Europe.

I. DISPOSAL - Incineration

Anonymous:

240. BURNER NOW FEATURES ALUMINIZED STEEL SKIN: Refuse Removal Journal, 2:7:21, July 1959.

The use of aluminized steel, manufactured by a new and exclusive process, is now being used in one type of burner. The important features of this burner, with aluminized skin, are described.

241. CHICAGO CHAPTER TOURS INCINERATOR PLANT: American Public Works Association News Letter, 26:12:2, December 1959.

A description of Chicago's 1200-ton incinerator constructed in 1959 at a cost of over 5½ million dollars. The design elements of the building and equipment are discussed. This modern plant is the second of four scheduled for construction by Chicago.

242. CLEVELAND INCINERATOR HAS NEW FLOOR TOPPING: Refuse Removal Journal, 2:12:10, December 1959.

A complete description of the construction and use of a new all-iron aggregate, concrete topping on the pit floor of an incinerator plant in Cleveland, Ohio. This new floor topping reportedly will enable the pit bottom to withstand the continuous brutal punishment associated with normal operation of this 500-ton incinerator.

243. DRIVER DIES AFTER FALL IN INCINERATOR: Refuse Removal Journal, 1:6:11, June 1958.

A Wilkes-Barre, Pennsylvania, refuse truck driver was walking backward guiding a truck into dumping position on a concrete platform just above the fire bed when he stepped into an opening and fell into the flames. Before other workers could help him out of the incinerator, 90% of his body had third-degree burns. Death occurred shortly after his arrival at the hospital.

I. DISPOSAL - Incineration

Anonymous:

244. INCINERATION DESIGN CRITERIA: The American City, 73:12:36, December 1958.

Design criteria for an incinerator furnace by Clark are given. It is pointed out also that he believes it more logical to rate incinerators on the basis of tons of refuse burned per week, rather than on the basis of per 24 hours.

245. INCINERATION HISTORY TOOK FORM IN ENGLAND: Refuse Removal Journal, 2:1:18, January 1959.

A brief history of the development of modern incinerators is presented - "of interest to all in the sanitation field."

246. INCINERATOR NEAR RESIDENTIAL AREA IS NUISANCE FREE: Public WORKS, 89:6:90, June 1958.

East Hartford, Connecticut, reports on its 200-ton per day incinerator serving about 60,000 people. Descriptive article includes diagrams of the plant.

247. INCINERATOR WILL HAVE SHORT STACK, DUST COLLECTOR: The American City, 74:4:40, March 1959.

The new incinerator at Belmont, Massachusetts, is inconspicuously designed with 20-foot stacks. A pair of aerostatic, centrifugal mechanical dust collectors have been incorporated into the design.

248. KEEP IT CLEAN: Public Cleansing and Salvage, 49:581:20, January 1959.

The developments during the past century in Glasgow's public cleansing services are reviewed. Great foresight on the part of early officials is evidenced by the fact that the method adopted at the works constructed in 1900 is basically the same as that now in operation at the new works at Polmadie.

249. A PARTIAL ANSWER TO THE SCRAP-YARD BURNING PROBLEM: The American City, 73:5:8, May 1958.

A demonstration at an Atlanta scrap yard proved scrap-yard burning can be controlled and need not cause the problem of air pollution. The unit used is described.

I. DISPOSAL - Incineration (Contd.)

Anonymous:

250. PRIVATE INCINERATOR CO. BEATS OPEN BURNING LAW: Refuse Removal Journal, 1:8:8, August 1958.

A tepee incinerator is modified so that refuse and such difficult articles as tires can be successfully burned while meeting air pollution control requirements at Newark, New Jersey.

251. SINGLE PRIVATE HAULER BUILDS OWN INCINERATOR: Refuse Removal Journal, 1:12:6, December 1958.

A 400-ton-per-day incinerator is being built by a Chicago, Illinois, firm to handle the disposal of refuse from 54,000 homes served by the company.

252. SMOKELESS INCINERATION FOR A BETTER VIEW: The American City, 73:9:18, September 1958.

A brief description of the specially designed, smokeless, incineration unit located near the Statue of Liberty. This unit, engineered and manufactured by the Silent Glow Oil Burner Corporation of Hartford, Connecticut, meets performance requirements of no offensive smoke, odor, or fly ash.

253. 0.72 CUBIC FEET OF FLY ASH PER TON OF REFUSE BURNED: The American City, 73:12:36, December 1958.

Cincinnati, Ohio, removes fly ash from its incinerator gases at the rate of 80 cubic yards per week through the use of expansion chambers. Brief details of the workings of the chambers are given.

254. WATERBORNE INCINERATOR BURNS DOCK WASTE: Engineering News-Record, 161:14:26, October 2, 1958.

Wastes from waterfront construction barged to sea on steel barges and burned.

American Society of Civil Engineers, Sanitary Engineering Research Committee:

255. SED RESEARCH PROJECT NO. 18: MUNICIPAL INCINERATOR DESIGN, A SURVEY OF ENGINEERING PRACTICE, Proceedings of the American Society of Civil Engineers, Journal of the Sanitary Engineering Division, 84:SA3:1677, June 1958.

This report contains the results of detailed information, supplied by Public Works officials, on the operation of their municipal incinerators. Construction trends and costs are comprehensively evaluated; detailed information on the type of refuse incinerated, the design data for the incinerator components, and other operational factors are summarized and reviewed.

Bender, Dwight O.

256. WE INCINERATE OUR REFUSE NOW: The American City, 73:4:167, April 1958.

This article covers the latest stage in the over-all, long range modernization program of collection and disposal in Indianapolis, Indiana. Also described is the newest incinerator in service there.

Clark, Samuel M.

257. CAPACITY CRITERIA FOR REFUSE INCINERATION: Proceedings of the American Society of Civil Engineers, Journal of the Sanitary Engineering Division, 84:SA5, 1783, September 1958.

The author suggests changes in accepted methods of stating refuse incinerating capacities, mainly to distinguish plant capacity from furnace capacity. The significance of the class of refuse to be burned is pointed out, and specific criteria, based roughly on BTU loadings, are suggested.

Douma, Conrad

258. CHICAGO HAULERS MAKE HISTORY BY BUILDING FIRST PRIVATE INCINERATOR: Public Cleansing and Salvage, 48:578:464, October 1958.

The way in which forty-five Chicago contractors solved their growing disposal problem through the construction of a private incinerator is reviewed. An investigation of U. S. incineration plants enabled the plan formation. Financial difficulties and the site problem were worked out; construction began. The many advantages of this private concern are described. The $2 million plant will have a capacity of 500 tons per 24 hours, and is composed of two 250-ton units.

259. CHICAGO HAULERS MAKE HISTORY BY BUILDING FIRST PRIVATE INCINERATOR: Refuse Removal Journal, 1:1:7, January 1958.

See item 258.

Foster, William S.

260. WHEN TO BUILD AN INCINERATOR: 1959 American Public Works Association Yearbook, page 124.

The frequent question of which means of refuse disposal - an open dump, sanitary landfill or incineration - is thoroughly discussed. Open dumps are strongly condemned. Incinerators recommended when landfill sites are scarce. Other factors relating to the decision to build an incinerator are considered, including reasonable design standards.

Gard, G. W.

261. A GOOD INCINERATOR SITE: The American City, 74:5:108, May 1959.

A 200-ton incinerator has been built in Lexington, Kentucky, with facilities sized for a 50% increase in capacity at a cost of approximately $705,000. The entire operational procedure, expenditures, and income are reviewed.

Glace, I. M. Jr.

262. A NEW TYPE OF MUNICIPAL INCINERATOR: The American City, 74:11:89, November 1959.

Whitemark Township, Pennsylvania, has constructed the nation's first "horizontal flow-through" incinerator, combining it with sewage purification. Thus, an efficient and economical system for both. The important constructional and operational features are described, along with the factors which have made it a good investment for the community.

Heaney, Frank L.

263. CHOOSING THE RIGHT INCINERATOR: Civil Engineering, 28:9:650, September 1958.

Types of incinerators, costs, factors to consider in selecting a site, and necessary furnace equipment are discussed briefly.

Kaiser, Elmer R.; Halitsky, James; Jacobs, M. B.; and McCabe, Louis C.

264. MODIFICATIONS TO REDUCE EMISSIONS FROM A FLUE-FED INCINERATOR. Technical Report 552.2, Project S53. New York: Research Division, College of Engineering, New York University. 52 pp. June 1959.

The emissions of particulate matter, noxious gases, smoke and odor from flue-fed, apartment-building incinerators contribute to the air pollution of cities and are a nuisance in neighborhoods. This paper, the second in a series, describes how existing installations of flue-fed incinerators may be modified to reduce the emissions to the atmosphere. Major reductions in emissions have been demonstrated.

Tests were conducted on the use of overfire air jets, supplemental gas firing, a stainless-steel secondary combustion chamber, a method of high-rate combustion, and a flue-fed scrubber. The devices are illustrated, and the emissions are reported and compared with those from the unmodified incinerator. Estimated investment and operating costs for the incinerator modifications have been included. The information will be helpful to incinerator builders, apartment owners, and air-pollution control officials.

Meissner, H. G.

265. MUNICIPAL INCINERATOR SELECTION: Public Works, 90:11:99, November 1959.

A wide range of new and improved equipment is available, from which municipalities, contemplating the installation of new incinerator facilities, may choose. This article discusses the pros and cons of these various designs for those concerned with their selection.

Michaels, Abraham

266. ENGINEER DISCUSSES INCINERATION COSTS: Refuse Removal Journal, 1:7:22, July 1958.

Factors to be considered in standardizing incineration costs are explained.

Rogus, Casimir A.

267. INCINERATION IN NEW YORK CITY: Sweep, 1:3:5, Autumn 1959.

A brief history of incineration in New York City, with an explanation of component parts, including present construction and operational costs.

I. DISPOSAL - Incineration - (Contd.)

Schneider, Carl

268. DESIGN AND OPERATION OF MUNICIPAL INCINERATORS: 1958 Public Works Engineers' Yearbook, page 133.

The changes in design of municipal incinerators, as well as those in the method of obtaining bids, are described. Among other factors considered are the changes in the character of refuse material, construction costs, and plant operation.

269. MUNICIPAL INCINERATOR DESIGN AND OPERATION: Refuse Removal Journal, 2:3:21, March 1959.

See item 268.

Sternitzke, R. F.

270. MUNICIPAL INCINERATOR TRENDS: Public Works, 89:9:112 September 1958.

The development of the modern municipal incinerator is described. Detailed description of the Birmingham incinerator is presented, covering its physical plant, operation, fly-ash control, and personnel.

Van Kleeck, Le Roy W.

271. A MODERN LOOK AT REFUSE INCINERATION: Public Works, 90:9:123, September 1959.

The ways in which the design of incinerators and their components have changed to increase operating efficiency and improve sanitation are reviewed. Newer operating practices which have led to greater safety and operating efficiency are also discussed.

Watson, Joseph W.

272. A CUSTOM-DESIGNED INCINERATOR: The American City, 74:2:102, February 1959.

An incineration plant has been designed and built in Hollywood, Florida, to fit the flat, low terrain, to take into account strong winds, and to be both functional and economical. This two-unit plant, which has operated at a capacity of 576 tons in 24 hours, cost only $694,000. Cost-saving features include an outdoor-type plant, low stacks, and direct charging facilities.

I. DISPOSAL - Incineration (Contd.)

Watson, Joseph W.

273. NEW INCINERATOR DESIGNED TO REDUCE FLY ASH EMISSION: Public Works, 89:4:97, April 1958.

The 450-ton incinerator under construction at Hollywood, Florida, is described briefly. One of the outstanding features of the planning is the building of the incinerator on a small land area, 190 feet by 330 feet.

Weaver, Leo

274. PASSED THE TEST: Public Cleansing, 49:588:558, September 1959.

The stringent requirements which must be met by municipal incinerators today are discussed in light of air pollution problems. Specific plants considered especially efficient are discussed.

Wegman, Leonard S.

275. BINGHAMTON'S INCINERATOR AFTER ONE YEAR: Civil Engineering, 28:6:413, June 1958.

Design, construction, and operation of Binghamton, New York, crane-and-bin type of incinerator are covered in detail.

Wheeler, Carl F.

276. DIRECT CHARGE INCINERATORS CAN DO A GOOD JOB: The American City, 74:5:197, May 1959.

Recent remodeling of Durham's beehive type incinerator has proven it low in modernization costs, in addition to being low in initial and operational costs. The article reviews the remodeling process and present operation.

J. DISPOSAL - Open Dumps

Anonymous:

277. CONTRACTOR AND VILLAGE STOP NUISANCE: Refuse Removal Journal, 2:8:17, August 1959.

The combination of science and hard work has eliminated objections to a garbage dump near Elk Grove Village, Illinois. Particulars of this operation are reviewed briefly.

J. DISPOSAL - Open Dumps

Anonymous:

278. TEA PARTY SQUELCHES ODOR COMPLAINTS: The American City, 74:1:22, January 1959.

This brief report describes the way Commissioner J. T. Waggoner of Birmingham answered odor complaints and prevented a court injunction against the city to close the sanitary landfill by holding a tea party on the landfill area.

Bellizic, John A.

279. A DUMP IS A NUISANCE: Sanitalk, 8:1:10, December 1959.

Because of the increased number of dump complaints and the expansion of research in refuse disposal methods, there is an indicative need for the proper and sanitary disposal of solid wastes. The Massachusetts Legislature, recognizing the need for corrective action, enacted a bill which now is Section 150A of Chapter 111 of the General Laws. It provides that the assignment of an area for a dumping ground be modified by requiring that the area be operated as a sanitary landfill.

Black, Ralph J.; Near, Lloyd B.

280. CONTROLLED BURNING ON REFUSE DUMPS: California Vector Views, 6:9:55, November 1959.

A discussion of the operation of controlled burning dumps. Included is a description of the three types of controlled burning dumps, the five classes of material to be burned, and the advantages of this method of refuse disposal.

Green, L. B.

281. MONTGOMERY'S MULTI-DUMP LANDFILL PROGRAM: The American City, 73:9:118, September 1958.

Several classified sites in Montgomery are making possible an economical and convenient means of disposal for garbage and refuse at no direct cost to the citizens or business firms. The details of the city's program are outlined.

J. DISPOSAL - Open Dumps (Contd.)

La Brecque, G. C.

282. APPLICATION OF INSECTICIDES AT DUMPS: Public Works, 89:7:92, July 1958.

Where sanitary fills are not used at dump areas to control insects, insecticide applications are highly advised. Various dry or liquid baits or sprays are suggested to suppress infesting insect populations.

Miles, E. J.

283. DISINFECTION AND CONTROL OF PESTS ON REFUSE TIPS: Royal Society of Health Journal, 79:3:268, May-June 1959.

The problem of fly control at tips (open dumps) is discussed, together with insecticide treatment. Controlled tipping (sanitary landfill) method is reviewed as a better alternative to using insecticides.

Stegner, Wallace

284. THE TOWN DUMP: The Atlantic Monthly, 204:4:78, October 1959.

Whitemud's (Saskatchewan) dump as a catalyst to a small boy's imagination and resourcefulness.

K. DISPOSAL - Salvage

Anonymous:

285. PHILADELPHIA YOUTH'S PERSISTENCE FINDS BURIED THREASURE--IN A DUMP!: Refuse Removal Journal, 1:1:14, January 1958.

A box of archeological treasures were recovered from a dump by deductive reasoning and quick action.

Xanten, William A.

286. RECLAMATION AND SALVAGE: Refuse Removal Journal, 2:12:17, December 1959.

See item 287.

K. DISPOSAL - Salvage (Contd.)

Xanten, William A.

287. RECLAMATION AND SALVAGE OPERATIONS: 1959 American Public Works Association Yearbook, page 92.

The pros and cons of reclamtion and salvage operations are thoroughly discussed by Mr. Xan[illegible]. The salvaging of material, as a possible solution to the problems encountered daily in municipalities, is detailed in terms of salvageable materials in refuse methods of "partial" salvaging, wastes heat utilization, and research and development. An excellent article for officials considering this problematic subject of reclamation and salvage operations.

L. DISPOSAL - Sanitary Landfill

Anonymous:

288. BUCHANAN'S LANDFILL USES 4-WHEEL TRACTOR: Refuse Removal Journal, 1:9:24, September 1958.

Details are given for the use of a rubber-tired, four-wheeled tractor shovel on landfill work at Buchanan, Michigan.

289. COMPANY GIVES HINTS FOR BETTER LANDFILLS: Refuse Removal Journal, 1:2:12, February 1958.

A successful sanitary landfill operation using crawler tractors equipped with specially designed front end loaders.

290. DAYTON BURIES NONBURNABLES: The American City, 73:4:29, April 1958.

Dayton, Ohio's operation of three sanitary landfills for the disposal of nonburnable material, (e.g., glass, ashes), is described briefly.

291. FLY EMERGENCY CONTROL IN SANITARY LANDFILLS: Refuse Removal Journal, 1:5:13, May 1958.

A condensation of item 314.

292. HOW TO GET GOOD COMPACTION IN A SANITARY FILL: The American City, 73:12:36, December 1958.

One of the most important factors in obtaining good compaction is the degree of skill of the equipment operator. Other factors, such as moisture content. are discussed briefly.

Anonymous:

293. HOW TO PICK A SITE FOR A SANITARY LANDFILL: The American City, 73:10:15, October 1958.

In this brief article, the following points are emphasized for consideration in the selection of a site: (1) the area, (2) the trucking required, (3) protection from weather elements; (4) the soil conditions, and (5) the possible advantages of a small site.

294. LANDFILL METHOD COMES TO CAPITAL OF MALAYA: Refuse Removal Journal, 1:4:17, April 1958.

A detailed account of the 1950 introduction of sanitary landfill methods in Kuala Lumpur, the capital of the Federation of Malaya. The initial project was the filling of a waterlogged pond. Spreading of the refuse and covering it with sand were done by two gangs of 32 men with rakes.

295. NEW YORK RUNS WORLD'S LARGEST SANITARY FILL: Refuse Removal Journal, 2:3:7, March 1959.

The world's largest sanitary landfill project at Fresh Kills, Staten Island, New York City, is described. In operation now for ten years, the fill takes one-third of the city's total refuse volume.

296. OPEN DUMPS ARE DISAPPEARING IN NEW JERSEY: The American City, 74:6:31, June 1959.

This brief article points out that the number of sanitary landfills and the number of municipalities using them in New Jersey has increased almost 200 percent since 1957. Cost of landfill operation is given.

297. OPERATION OF SANITARY LANDFILLS: Public Works, 89:9:115, September 1958.

Factors to be considered in the establishment of sanitary landfills, distance of haul, area needed, neighbors, cost of land, topography, control of dumping, cover material availability are reviewed. Preparation of the site and the trench, ramp, and area methods of operation are described.

298. OPERATION OF SANITARY LANDFILLS BY COUNTIES: Public Works, 90:2:125, February 1959.

Report of a questionnaire, nationwide survey by Public Works Magazine, giving data on financing, equipment used, charges made, and future plans for county-operated sanitary landfills.

L. DISPOSAL - Sanitary Landfill (Contd.)

Anonymous:

299. PLANNING IS THE KEY TO AMES' LANDFILL SUCCESS: Refuse Removal Journal, 1:7:9, July 1958.

The city of Ames, Iowa, is currently operating a sanitary landfill which will become a 350-acre industrial park upon its completion. An over-all street plan to serve the area has been developed. The necessary utility service has been designed and partially installed, a final contour map established, and an over-all site plan has been developed. Present costs for refuse disposal are $1.62 per ton.

300. PRIVATE LANDFILL SERVES LARGE INDIANAPOLIS AREA: Refuse Removal Journal, 2:1:10, January 1959.

Marginal land is being reclaimed near Indianapolis through a sanitary landfill project. The use of this site by both individuals and private contractors is detailed.

301. A SANITARY FILL WITH A "MISSION": The American City, 73:2:17, February 1958.

The Mission Bay sanitary landfill project is described. It is hoped that this poor land may be transformed into a fine boat harbor and an attractive aquatic recreational area.

302. SANITARY LANDFILL PROJECTS SERVE BOTH CITY AND CONTRACTOR: Public Works, 89:8:111, August 1958.

As an illustration of a close-in sanitary landfill project, a development company of Melrose Park, Illinois, is discussed in terms of its organization and function. This project was proposed to solve both the cost of long-distance hauling of refuse and the filling of the lowland area so that a park could be developed.

303. SANITARY LANDFILL SOLVES PARK DEVELOPMENT PROBLEM: The American City, 73:7:35, July 1958.

Forty-six acres of park land will soon be made available for development in Elmhurst, Illinois, due to cooperation between city authorities and a private refuse collection and disposal firm. A sanitary landfill program has been used to solve both the high cost of long-distance refuse hauling and the filling in of lowland property for park development.

L. DISPOSAL - Sanitary Landfill (Contd.)

Anonymous:

304. STUDY BURIAL OF REFUSE AS CURB ON FLIES: Public Health Reports, 73:12:1138, December 1958.

This brief article reports on a study conducted by the California State Department of Public Health, Bureau of Vector Control. The subject was whether or not prompt burial of refuse effectively inhibits fly emergence from refuse, which, during collection in warm weather, already abounds in fly eggs and larvae. The conclusions reached are discussed. See item 314.

305. TRACTOR TESTS POINT WAY TO MORE EFFICIENCY: Refuse Removal Journal, 1:3:13, March 1958.

A condensation of item 339.

306. TWO MORE TOWNS TURN TO SANITARY LANDFILL: Refuse Removal Journal, 1:1:12, January 1958.

Operational details of the conversion of open dumps to sanitary landfills are given for Union City, Tennessee, and Santa Barbara, California, with a discussion of techniques generally used in small towns.

307. TWO SPECTACULAR FILLS IN WEST, MIDDLE WEST: Refuse Removal Journal, 1:2:20, February 1958.

The sanitary landfills of Waterloo, Iowa, and Burbank, California, are cited for their excellence of operation and use of the completed fills.

American Society of Civil Engineers, Committee on Sanitary Landfill Practice:

308. SANITARY LANDFILL: ASCE--MANUALS OF ENGINEERING PRACTICE--NO. 39. 62 pp. 1959.

A compilation of the desirable and accepted practices involved in the operation of satisfactory sanitary landfills. Topics discussed include site selection, methods of operation, special operational considerations, equipment, public health and nuisance considerations, uses of the completed fill, cost data, and administration.

L. DISPOSAL - Sanitary Landfill (Contd.)

American Society of Civil Engineers, Sanitary Engineering Research Committee:

309. REFUSE VOLUME REDUCTION IN A SANITARY LANDFILL: TWENTY-SIXTH PROGRESS REPORT OF THE COMMITTEE ON SANITARY ENGINEERING RESEARCH OF THE SANITARY ENGINEERING DIVISION: Proceedings of the American Society of Civil Engineers, Journal of the Sanitary Engineering Division, 85:SA6:2250, November 1959.

An engineering investigation was undertaken to ascertain the extent of refuse volume reduction that can be achieved initially and after a long period of storage in a sanitary landfill. The resulting experimental data and field information are summarized.

310. SED RESEARCH PROJECT NO. 21: SANITARY LANDFILL TESTS INVESTIGATING REFUSE VOLUME REDUCTION AND OTHER PHENOMENA: Proceedings of the American Society of Civil Engineers, Journal of the Sanitary Engineering Division, 84:SA6:1853, November 1958.

At the Union Bay Sanitary Landfill Disposal site, Seattle, Washington, tests have been performed over a one-year period to ascertain compaction, settlement, fill temperature, and gas production. These data are critically reviewed with reference to obtaining optimum refuse disposal volume in a given landfill area.

Anderegg, R. A.

311. SANITARY LANDFILL PROVES FINANCIALLY BEST: The American City, 73:7:159, July 1958.

The establishment of a sanitary landfill for garbage disposal in Wyoming, Ohio, has proved economical and has eliminated smoke and rats there. The details of the highly successful method of collection and disposal are given.

Black, Ralph J.

312. SANITARY LANDFILLS SERVING CALIFORNIA COMMUNITIES IN 1957: California Vector Views, 5:5:27, May 1958.

This report, concerned with the operation of fifty-one sanitary landfills in California, bases its information on a survey conducted by the Bureau of Vector Control. The methods of operation used, the primary types of earth-moving equipment used, cover material utilized, and landfill operational costs are discussed briefly. A detailed chart, "Summary Data on the 51 Sanitary Landfills Serving California Communities," is included.

Black, Ralph J. and Barnes, A. M.

313. COMPACTED COVER PREVENTS FLY EMERGENCE AT SANITARY LANDFILLS: California Vector Views, 5:4:24, April 1958.

A brief summary is given of field investigations to test previous laboratory results of the effect of earth cover on fly emergence, conducted by the Bureau of Vector Control. A summary of the results of this investigation, at selected California sanitary landfills, is presented in chart form.

314. EFFECT OF EARTH COVER ON FLY EMERGENCE FROM SANITARY LANDFILLS: Public Works, 89:2:91, February 1958.

The California State Department of Public Health reports on a study of fly emergence from six sanitary landfills differing in degree of compaction due to different types of equipment, soil, moisture content, and thickness of cover.

Bowerman, F. R.

315. LOS ANGELES' ANSWER TO THE LONG HAUL PROBLEM: The American City, 73:10:132, October 1958.

The Los Angeles County ban on home incinerators caused the need for the construction and operation of county sanitary landfills and transfer stations. The details of the District program, which followed a comprehensive study, are given.

Bowers, Nathan A.

316. SANITARY FILL PROVES OUT FOR PLANT SITES: Engineering News-Record, 161:25:44, December 18, 1958.

History of San Francisco sanitary landfill, explaining past and present operation. Settling and decomposition are discussed. Special precautions taken in erecting several industrial buildings on the fill to allow for settling are given.

Bradley, C. L.

317. THE SANITARY LANDFILL IN NORTH DAKOTA: The Sanitarian, 22:2:80, September-October 1959.

A description of the successful use of the sanitary landfill in North Dakota. This article describes the various soils suitable for landfills in cold climates and discusses equipment requirements.

L. DISPOSAL - Sanitary Landfill (Contd.)

Carpenter, J. M. and Dove, Lloyd A.

318. BURY GARBAGE ACCORDING TO PLAN: The American City, 73:6:92, June 1958.

Ames, Iowa, is conducting sanitary landfill operations on a site being developed for future industrial use. The development plans are outlined; operational costs given, with the point made that while the landfill cannot be noted for low cost in operation, the fact of possible land value in the future, the neatness of the area, and the lack of rodents and vermin justify the expenditures.

Dunn, Walter L.

319. SANITARY LANDFILL EXTENDS UNIVERSITY CAMPUS: The American City, 74:4:97, March 1959.

The University of Washington is gaining much needed land, and the city of Seattle is saving long-distance refuse hauling costs through a sanitary landfill program. Details of this practical plan are reviewed.

Edlefsen, Russel E.; Hunt, Joseph W.; Olson, Robert P.

320. JOINT PROGRAM SOLVES REFUSE DISPOSAL PROBLEM: The American City, 73:8:161, August 1958.

A vector control demonstration project, as a cooperative program between the City-County Health Department (Boise-Ada County), Idaho State Board of Health, and the U. S. Public Health Service, Communicable Disease Center, was started in 1955. As a result of the necessity for abandonment of the open dump, a sanitary landfill operation was adopted and has proved a successful, cooperative undertaking.

Feldman, Maurice

321. SANITARY LANDFILLS: SWAMPS / REFUSE / ENGINEERING / MUSCLE = PARKS; Sweep, 1:4:7, Winter 1959.

The history, present practices, and use of New York City landfill areas are discussed.

Hay, Robert A.

322. WESTPORT TEA PARTY BOOSTS SANITARY LANDFILL POPULARITY: The American City, 73:2:87, February 1958.

Westport's perplexing problem of where to dispose of garbage and refuse is presented. Improved operating procedures and a successful "tea party" at the landfill site have proved the operations more sanitary and acceptable.

Hedges, Bill

323. SPRINGFIELD, MO. TAKES OVER GARBAGE COLLECTION: The American City, 73:11:189, November 1958.

The city of Springfield found it necessary to adopt sanitary landfill method of garbage disposal as objections arose to open dump and as hog feeding of garbage decreased. The details of the system, costing approximately $100,000 annually, are given.

Johnson, Wilfred H.

324. THE SANITARY LANDFILL: The Sanitarian, 22:2:83, September-October 1959.

A general discussion of sanitary landfills including site selection, land requirements and length of haul, equipment, personnel, operation on different terrains, small community operation, winter and inclement weather operation, recommended operating practices, and accessory facilities. Also given are advantages and disadvantages of sanitary landfill, a comparison of landfills and incinerators, sources of audio-visual aids, and twenty-four references.

Kennaugh, John H.

325. REPORT FROM BUCHANAN: Refuse Removal Journal, 2:2:18, February 1959.

Mr. Kennaugh comments on Buchanan's landfill operation, which employs a rubber-tired tractor. The method used and expenses are outlined.

Lawrence, Lydia

326. LET'S PUT OUR REFUSE TO GOOD USE: Reader's Digest, 75:452:166, December 1959. (Condensed from National Civic Review, November 1959)

Highlights of the growing acceptance of the sanitary landfill method of refuse disposal during the past ten years are featured. Land reclamation aspects and nuisance-free operation are stressed.

Marquez, Archie

327. CONVERTED INCINERATOR MAKES EXCELLENT TRANSFER STATION: The American City, 73:12:73, December 1958.

Tenafly's new garbage disposal operation results in better service at less cost. The 1938 incinerator was converted into a transfer station; landfill disposal began. The success of the new system is discussed also in terms of better service.

McBride, John H.

328. SANITARY FILL WAS A CAMPAIGN PROMISE: The American City, 73:11:38, November 1958.

In Belzani, Mississippi, a sanitary landfill replaced a rodent-infested dump as a result of McBride's campaign promise and his later election. Brief sketch of its operation given.

Menon, K. P. V.

329. THE DISPOSAL OF REFUSE IN KUALA LUMPUR, MAYLAYA: Public Cleansing and Salvage, 48:572:165, April 1958.

This article is a condensation of a thesis by the assistant town superintendent of Kuala Lumpur. The success of controlled tipping, introduced there in 1950, is discussed. The availability of nearby disposal sites and sand for tip cover is an important factor in this method of refuse disposal.

Moehr, Louis H.

330. CITY ENGINEER GIVES FULL STORY OF LANDFILL METHOD: Refuse Removal Journal, 1:5:21, May 1958.

The sanitary landfill method is discussed in detail along with local experience in Wyandotte, Michigan. Trench and fill method is reported to cost $1.70 per ton, including 10% for overhead.

Myers, Wilson J.

331. SANITARY LANDFILL COSTS AND EQUIPMENT: 1959 American Public Works Association Yearbook, page 112.

The problem of garbage disposal and its annual deficit in Canton, Ohio, was one assumed by Mr. Myers on his acceptance of the post of director of public service in 1958. On the basis of a study team's findings there, sanitary landfill was decided upon as the most economic solution to the city's problems. The considerations and subsequent steps necessary in initiating this system are thoroughly discussed by Myers.

Paino, Bart and Olsen, Chris E.

332. INSECT AND ODOR CONTROL IN SANITARY LANDFILLS: Refuse Removal Journal, 2:4:8, April 1959.

The odorless and nuisance-free landfill at Dobbs Ferry, New York, resulting from research and experimentation, is discussed. Complaints of neighbors were ended with the use of chemicals.

Potthoff, Edward H. Jr.

333. DRAINED CANAL SERVES AS SANITARY LANDFILL SITE: The American City, 74:4:102, April 1959.

Within the next four years a drained canal will become valuable land through a sanitary landfill project in Niagara Falls. Details of the project are discussed.

Robertson, G. R.

334. REFUSE COLLECTION AND DISPOSAL IN ALBUQUERQUE: Public Works, 89:6:110, June 1958.

Article is the refuse collection and disposal portion of the annual report of the superintendent of the sanitation department in Albuquerque, New Mexico. The collection and disposal of refuse by sanitary landfill are described.

Rogus, Casimir A.

335. USE OF COMPLETED SANITARY LANDFILLS: Refuse Removal Journal 2:11:10, November 1959.

See item 336.

Rogus, Casimir A.

336. USE OF COMPLETED SANITARY LANDFILL SITES: 1959 American Public Works Association Yearbook, page 129.

The basic factors involved and minimum requirements essential to safe and nuisance-free usage of fills are discussed. The potential hazards of fills which are considered include gas emission, odor nuisances, settlement, rodent and insect problems, fire hazards, water pollution, and landscaping. It is pointed out, however, that the problems in using a completed sanitary landfill are minimized, while those for the uncontrolled refuse dump are more frequent and more difficult.

Van Kleeck, Le Roy W.

337. SAFETY PRACTICES AT SANITARY LANDFILLS: Public Works, 90:8:113, August 1959.

The general areas of employee safety, area safety, equipment control, and general safety are discussed by Mr. Van Kleeck. Hazards are pointed out; safety precautions outlined.

Williams, Edward R.; Mallison, George F.; Maier, Paul P.

338. THE EFFECT OF ADDING WATER TO MUNICIPAL REFUSE FOR INCREASED COMPACTION IN SANITARY LANDFILLS: Public Works, 90:10:129, October 1959.

The findings of the United States Public Health Service on a study concerned with the effects of adding water to municipal refuse are reviewed. The test results have led to the conclusion that the addition of quantities of water up to 20 percent by weight of the refuse to increase compaction in a sanitary landfill is of no practical value.

339. LIGHT EQUIPMENT FOR SMALL TOWN SANITARY LANDFILL OPERATIONS: Public Works, 89:2:89, February 1958.

A comparison is made of two lightweight tractors used in a sanitary landfill to dispose of an average of 68.6 tons of refuse per week in a town of about 4,500 people. Cost and efficiency data are given, and recommendations are made as a result of the study.

L. DISPOSAL - Sanitary Landfill (Contd.)

Winkler, Theodore E.

340. THE COMPACTION AND SETTLEMENT OF SANITARY LANDFILLS: 1958 Public Works Engineers' Yearbook, page 128.

Various methods of operating sanitary landfills are described. The importance of knowing the intended use of the land before filling is begun, in order to reduce construction and utilization costs, is stressed.

341. COMPACTION, SETTLEMENT OF SANITARY LANDFILLS: Refuse Removal Journal, 1:12:8, December 1958.

See item 340.

Zemlansky, John

342. SANITARY LANDFILLS: Public Health News, 39:9:282, September 1958.

The interest of the New Jersey State Department of Health in the problem of solid waste disposal is stressed. The author outlines disposal by incineration and the use of sanitary landfills. The latter method is favored, where feasible, due to the economy, practicality, and beneficial results.

M. LITTER - Collection and Disposal

Anonymous:

343. KEEPING SAN FRANCISCO'S STREETS CLEAN: Street Engineering, 3:3:15, March 1959.

Staff report outlining the organization of the 335-man bureau of street cleaning. Types of equipment, crew organization and operation data are given. Special attention is given to the litter problem and methods of handling litter.

344. MUCH OF YEARLY FIRE LOSS LAID TO LITTER: Refuse Removal Journal, 2:10:12, October 1959.

The national economic burden of litter-caused fires is great. A public service group's research shows startling declines in fire losses whenever campaigns against littering have been successful.

M. LITTER - Collection and Disposal (Contd.)

Anonymous:

345. NEW KANSAS CITY LITTER ORDINANCE: The-American City, 74:2:25, February 1959.

A new 22-section litter ordinance has been passed by Kansas City, Missouri, officials. Litter baskets have been designed to hang on car dashboards. Fines from $5 for first offense to $500 for repeated ones are now imposed for littering.

346. PARADE FEATURES DRIVE FOR CLEANER CITY: Refuse Removal Journal, 2:7:6, July 1959.

The city of Chicago recently held a Cleaner Sidewalk Week, in addition to its seventh annual parade for a cleaner city. As a part of the effort for cleaner sidewalks, 500 women volunteers obtained pledges of cooperation from 20,000 local businesses.

347. PHILADELPHIA COMBATS LITTER WITH GAY TRASH CONTAINERS: The American City, 73:10:15, October 1958.

The Streets Department of Philadelphia has set out new trash receptacles at central city locations with the simple slogan, "Put Litter Here." Because the receptacles are brightly painted in gold and blue, no need was felt for catch slogans.

348. PUBLIC SERVICE GROUP FIGHTS LITTER MENACE: Refuse Removal Journal, 2:8:20, August 1959.

Many organizations are cooperating to combat the positive dangers resulting from uncontrolled littering of outdoor areas. One organization points out these dangers as well as the obviously unpleasant visual effect. Various State fines and regulations are cited.

349. VIGOROUS CAMPAIGN EASES TOWNSHIP LITTER PROBLEM: Refuse Removal Journal, 2:10:20, October 1959.

The town of Hempstead, Long Island, New York, the largest U. S. township, holds an annual month-long cleanup campaign and uses year-round publicity to awake civic pride of residents. The result: a cleaner, more sanitary appearance.

M. LITTER - Collection and Disposal (Contd.)

Calver, Homer N.

350. LITTER AND THE PUBLIC HEALTH: Public Health Reports, 74:5:387, May 1959.

Cleanup campaigns and litter prevention programs in various U. S. cities are reviewed. A four-point formula for litter prevention is outlined as a suggestion for communities.

Fairlie, P. D.

351. STREET CLEANSING: Public Cleansing and Salvage, 48:570:63, February 1958.

The various sources of street refuse in Glasgow are considered, such as atmospheric pollution and spillage from vehicles. Refuse removal in terms of these factors is discussed.

Moore, Gerald L.

352. A SPRUCE-UP PROGRAM THAT WORKS: The American City, 74:3:119, March 1959.

The Downtown Council in Minneapolis is sponsoring a highly successful, long-range downtown beautification program. Details of this civic group project are discussed.

Mulrain, Andrew W.

353. HOW BIGGEST CLEANUP CAMPAIGN WAS HANDLED: Refuse Removal Journal, 1:6:13, June 1958.

New York City's cleanup campaign is described in detail by a former commissioner of sanitation. As a result of the establishment of a litter basket and anti-litter program, approximately 100,000,000 pounds of litter per year are now deposited in litter baskets instead of being thrown into the streets. An alternate-side, restricted parking control program was evolved to assist in the cleaning of streets. Vacant lots were cleaned up and a regular junk collection service provided. An extensive educational program was conducted to enlist public support, and finally an enforcement program was instituted to secure compliance. Approximately $100 million per year is the value placed on the public cooperation now being received.

Nicholas, R.

354. SOME NOTES ON MANCHESTER'S ANTI-LITTER CAMPAIGN: Public Cleansing and Salvage, 48:577:423, September 1958.

Manchester's anti-litter campaign is outlined. Extensive publicity and suspension of some street sweeping seem to have made the residents more litter conscious, both during and after the campaign.

Passey, R. G.

355. PUBLICITY IN RELATION TO THE LITTER PROBLEM: Public Cleansing, 49:587:439, July-August 1959.

Two solutions are offered to the British litter problem -- education and prosecution.

Ruskin, John H. and Blanding, Hugh G.

356. DETROIT EDUCATES CITIZENS TO IMPROVE SANITATION: The American City, 73:4:114, April 1958.

The educational enforcement approach in Detroit's "cleaner, healthier city" campaign has proven to be an effective one. The objective of proper household storage of garbage and rubbish was achieved within two years.

Screvane, Paul R.

357. NEW YORK CITY IS CLEANER: The American City, 74:4:96, April 1959.

Four years ago Robert Wagner, New York City Mayor, formed a citizen's committee to promote a clean city program. Actual field surveys are now proving the success of this continuing project. Details of the effort are described.

Tester, Clyde A.

358. PRESS COMMENT SPURS LITTER DRIVE: The American City, 74:4:43, April 1959.

Adverse newspaper publicity started action for a cleaner downtown area in St. Paul. The details of the program are reviewed briefly.

Periodical Publications Cited

The American City
American Public Works Association News Letter
(formerly Public Works Engineers' News Letter)
The Atlantic Monthly
California Vector Views
Civil Engineering
Engineering News-Record
Modern Sanitation and Building Maintenance
Journal of the American Medical Association
Journal of the Sanitary Engineering Division, American Society of Civil Engineers
Public Cleansing (formerly Public Cleansing and Salvage)
Public Health News
Public Health Reports
Public Management
Public Works
Reader's Digest
Refuse Removal Journal
Royal Society of Health Journal
Sanitalk
The Sanitarian
Street Engineering
Sweep
Texas Health Bulletin

Other Publications Cited

AMERICAN PUBLIC WORKS ASSOCIATION YEARBOOK, 1959. Chicago: American Public Works Association. 434 pp.; $5.00.

MODIFICATIONS TO REDUCE EMISSIONS FROM A FLUE-FED INCINERATOR. Technical Report 552.2, Project S53. By Elmer R. Kaiser, James Halitsky, M. B. Jacobs, and Louis C. McCabe. New York: Research Division College of Engineering, New York University. 52 pp. June 1959.

PUBLIC WORKS ENGINEERS' YEARBOOK, 1958. Chicago: American Public Works Association. 436 pp.; $5.00.

PROCEEDINGS--NATIONAL CONFERENCE ON AIR POLLUTION. Public Health Service Publication No. 654. Washington: U. S. Government Printing Office, 1959. 526 pp.; $1.75.

REFUSE COLLECTION PRACTICE, Second Edition. A.P.W.A. Research Foundation Project No. 101. Chicago: Public Administration Service, 1958. 562 pp.; $8.00.

SANITARY LANDFILL. A.S.C.E.--Manuals of Engineering Practice - No. 39. New York: American Society of Civil Engineers, 1959. 62 pp.; $2.00.

STREET CLEANING PRACTICE, Second Edition. A.P.W.A. Research Foundation Project No. 105. Chicago: Public Administration Service, 1959. 424 pp.; $7.00.

Author Index

(Senior author reference numbers are underlined)

American Public Works Association 163, 164
American Society of Civil Engineers 58, 229, 255, 308, 309, 310
Anderegg, R. A. 311
Andersen, D. A. 165, 166

Barnes, A. M. 313, 314
Bellizia, John A. 279
Bender, Dwight O. 256
Bevan, R. E. 59
Black, Ralph J. 280, 312, 313, 314
Blanding, Hugh G. 356
Blatt, Donald H. 167
Bloodgood, Don E. 168
Bowerman, F. R. 206, 315
Bowers, Nathan A. 316
Bradley, C. L. 317
Bridger, Roy 230, 231
Brown, C. N. 169
Burton, Grant H. 60

Calver, Homer N. 350
Carpenter, J. M. 318
Carreau, Joseph W. 170
Chambers, Leslie A. 207
Clark, Samuel M. 257
Cook, H. 171
Cowan, John H. 208
Creisler, Joe 9, 209
Creswell, M. C. 172

Davies, A. G. 61, 173, 210
Dempster, Andrew 175
Douma, Conrad 258, 259
Dove, Lloyd A. 318
Dowling, John C. 174
Duncan, Alexr. H. 62
Dunlap, Roy L. 16
Dunn, Walter L. 319

Edlefsen, Russel E. 320
Eliassen, Rolf 211
Eppig, Theodore C. 116, 117
Erhard, Heinrich 118

Fagerlind, Carl C. 119
Fairlie, P. D. 351
Feldman, Maurice 321
Flint, G. H. 120
Foster, William S. 260

Gard, G. W. 261
Gentile, S. G. 175
Gentillion, M. B. 121
Glace, J. M. Jr., 262
Gordon, C. A. 232
Gothard, S. A. 233
Graham, Ralph C. 10
Green, L. B. 281
Gross, William J. 176
Grossman, Moses 212

Hay, Robert A. 322
Halitsky, James 264
Heaney, Frank L. 263
Hedges, Bill 323
Hunt, Joseph W. 320
Hurst, Valerie 212

Ingram, Fred R. 212

Jacobs, M. B. 264
Johnson, Theodore F. 177
Johnson, Wilfred H. 324
Jones, Bert E. 63

Kaiser, Elmer 264
Keane, Mark E. 17
Kennaugh, John H. 325
Kennedy, Everett R. 178
Kenny, A. W. 213

La Brecque, G. C. 282
Lawrence, Lydia 326
Leake, John W. 18
Liebman, Henry 64
Lowe, Nan E. 212
Lucia, Frank J. 122

Maier, Paul P. 338, 339
Mallison, George F. 338, 339
Marquez, Archie 327
Marsh, John 179
Martin-Leake, H. 234
McBride, John H. 328
McCabe, Louis C. 264
Meissner, H. G. 265
Menon, K. P. V. 329
Michaels, Abraham 214, 266
Miles, E. J. 283
Millard, R. F. 123
Moehr, Louis H. 330
Moore, Gerald L. 352
Mulrain, Andrew W. 353
Myers, Wilson J. 331

Near, Lloyd B. 280
Neilson, Robert W. 180, 181
Nesbitt, John B. 235
Nicholas, R. 354
Noe, Theodore H. 182

Olsen, Chris E. 332
Olson, Robert P. 320

Paino, Bart 332
Passey, R. G. 355
Peacock, C. 183
Peel, R. 68
Potthoff, Edward H., Jr. 333

Ramker, D. F. 34
Robertson, G. B. 184,
Robertson, G. R. 334
Rogus, Casimir A. 267, 335, 336
Ross, William E. 215
Ruskin, John H. 356

Schneider, Carl 268, 269
Schoof, H. F. 68
Schwartz, A. M. 65, 185
Scovel, Ralph E. 236
Screvane, Paul R. 357
Seeger, Deane 186
Shannon, George C. 66
Shults, F. 187
Steffles, Milton J. 237
Stegner, Wallace 284
Stenman, Alex 124
Sternitzke, R. F. 270
Stirrup, F. L. 35, 238
Storm, Murray 216

Taylor, E. J. 67
Tester, Clyde A. 358

Urquhart, Raymond M. 188

Van Kleek, Le Roy W. 271, 337
Vincent, Charles L. 36, 37

Waldrop, R. H. 68
Watson, Joseph W. 272, 273
Weaver, Leo 274
Wegman, Leonard S. 275
Whalebone, D. P. 69
Wheeler, Carl F. 276
Williams, Edward R. 338, 339
Wilson, N. G. 70, 71, 239
Winkler, Theodore E. 340, 341

Xanten, William A. 286, 287

Zemlansky, John 342

U. S. GOVERNMENT PRINTING OFFICE : 1967 O - 244-289

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service BDP&EC
Solid Wastes Program

RECEIVED
NATIONAL TECHNICAL
FEB 2 1 1973
INFORMATION SERVICE

REGIONAL OFFICES

REGION I
John Fitzgerald Kennedy
Federal Building
Government Center
Boston, Massachusetts 02203

REGION II
Room 1200, 42 Broadway
New York, New York 10004

REGION III
220 7th Street, NE.
Charlottesville, Virginia 22901

REGION IV
Room 404
50 Seventh Street, NE.
Atlanta, Georgia 30323

REGION V
Room 712
New Post Office Building
433 West Van Buren Street
Chicago, Illinois 60607

REGION VI
601 East 12th Street
Kansas City, Missouri 64106

REGION VII
Ninth Floor
1114 Commerce Building
Dallas, Texas 75202

REGION VIII
9017 Federal Office Building
19th & Stout Street
Denver, Colorado 80202

REGION IX
Federal Office Building
50 Fulton Street
San Francisco, California 94102